Closing the Vocabulary Gap in Preschool: Explicit Vocabulary Intervention Embedded in Interactive Storybook Reading

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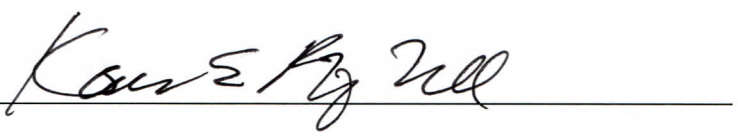
Signature 

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DEDICATION

I dedicate this dissertation to my mother, Patricia K. Ruff, who inspired me to pursue my doctorate through her never-ending pursuit of knowledge and her passion for understanding. My mother became an analytical chemist and later a chemistry teacher. When she lost her right arm to cancer, she was determined to continue to perform the demonstrations she loved, so she trained with her prosthetic arm to hold test tubes and flasks. This was extremely difficult yet she worked tirelessly to be not just a good but an excellent one-armed chemistry teacher.

My mother was so very proud of my decision to pursue this doctorate. She championed my passion for serving the under-served and supported me in my work. In the 1960s my mother, a young mother herself, worked to open the first childcare facility in her town so that mothers could seek work outside the home. Therefore, I proudly credit her for my desire to use my skills to serve others.

My mother was a magnificent role model for me. She showed through her life that the possibilities are limitless if you work hard, remain true to your passion, and always lead with your heart.

ABSTRACT

The impact of interactive storybook reading and embedded vocabulary instruction on expressive and receptive vocabulary learning of 4-year olds attending a Head Start program was evaluated. Ten tier two vocabulary words from two storybooks were targeted in a small group setting using repeated interactive storybook reading. The study examined whether explicit vocabulary intervention techniques provided within the interactive storybook reading increased word knowledge for preschool students from low socioeconomic households. Results comparing the treatment group with controls showed that both groups gained in receptive vocabulary knowledge, while a large effect-size was calculated for the intervention group. Semantic knowledge, or the ability to express the definitions of target words, showed small gains for the treatment group. Finally, the language sample data showed considerable spontaneous use of the target vocabulary words demonstrating expressive vocabulary skills.

Keywords: vocabulary gap, language delay, Head Start, interactive storybook reading (ISR), explicit vocabulary intervention

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Chapter I

INTRODUCTION

An early indicator of normal language development is the size of a child's vocabulary; as a child acquires language skills, she gains word knowledge. For the first year of life the child develops receptive vocabulary skills. At approximately 12 months, a child will typically speak her first word indicating that the processes of verbal working memory and cognition are functioning adequately to sequence the sounds of a word and learn a word's meaning. Once this milestone is attained, a period of rapid growth usually follows and at 18-months of age, a child with typical development has acquired 50 words or more. Vocabulary growth continues at a rapid rate until 36 months of age. After this initially steady increase in word knowledge, the rate of vocabulary acquisition varies greatly from child to child (Farkas & Beron, 2004; Heinrichs et al., 2011). Heinrichs et al. found that earlier vocabulary skills were predictive of later skills in word knowledge. The rate of word learning was found to be set at an early age, and growth in vocabulary remained steady over time.

An important early influence on word learning is the robustness of the vocabulary the child is exposed to in the home. In Hart and Risley's (1995) seminal longitudinal study on vocabulary acquisition, they examined the vocabulary diversity of the parents across income groups. This study found that parents of low socioeconomic status (SES) used half as many different words when speaking to their children than parents from the higher SES group. In turn, children of parents with low SES acquired fewer words than

their peers with higher SES. This difference in vocabulary size between children from low SES and high SES is called the vocabulary gap. Not only does this gap in vocabulary exist but it is evident early and persists into the elementary years (Farkas & Beron, 2004). A child's vocabulary size at 2 years of age is predictive of their skills at kindergarten entry (Morgan, Farkas, Hillemeier, Hammer & Maczuga, 2015). Furthermore, the rate of early vocabulary growth is predictive of word knowledge at school entry especially for children from low SES households (Rowe, Raudenbush & Goldin-Meadow, 2012).

The vocabulary gap is evident as early as 18 months of age (Fernald, Marchman & Weisleder, 2013; Henrichs et al., 2011; Pungello, Iruka, Dotterer, Mills-Koonce & Reznick, 2009; Reynolds, et al., 2017) and because vocabulary acquisition is cumulative, early deficits persist. A further investigation of the participants from the Hart and Risley (1995) study examined language skills when entering third grade. Results revealed that vocabulary deficits identified in the preschool years persisted well into elementary school (Hart & Risley, 2003). Mounting evidence shows that children entering school demonstrating weak vocabulary skills are at risk of depressed academic achievement (Catts, Fey, Zhang, & Tomblin, 2001; Elleman, Lindo, Morphy, & Compton, 2009). It has been shown that discrepancies in vocabulary knowledge emerge at very young ages and persist through the school years if not addressed (Catts, Adolf, & Weismer, 2006; Catts, et al., 2001; Cunningham & Stanovich, 1997; Hart & Risley, 1995; Storch & Whitehurst, 2002; Walker, Greenwood, Hart, & Carta, 1994).

According to the Brookings Institution, 52% of children from low-SES households lack school readiness skills at age 5 showing insufficient language skills, specifically vocabulary skills (Isaacs, 2012). Preschool is a pivotal time for language

development as oral language skills are strengthened, providing the foundation for later academic skills. Furthermore, these early language skills are particularly responsive to intervention in the preschool years (Dickinson, McCabe, & Essex, 2006). For this reason, the preschool years, a time of rapid vocabulary growth, are an important time for intervention to increase vocabulary skills before school entry (Farkas & Beron, 2004).

The purposes of the present study are to determine whether explicitly teaching vocabulary during interactive storybook reading impacts (1) receptive and expressive vocabulary (2) semantic knowledge (word definitions), and (3) spontaneous use of the vocabulary words.

Chapter II

LITERATURE REVIEW

Vocabulary is a repository of words and their meanings, which a listener uses to understand spoken language and a speaker uses to generate new messages. The receptive vocabulary consists of words that one understands, while expressive vocabulary consists of those words one can use productively. Usually words are learned and become part of one's receptive vocabulary before entering the expressive vocabulary. Learning new words from spoken language is a process that young babies achieve with increasing accuracy as a function of development. At about 6 months of age, most infants demonstrate comprehension of common words in their environment indicating early receptive vocabulary skills (Tsui, Byers-Heinlein, & Fennell, 2019). The first spoken word milestone is usually reached between 10-15 months of age. Prior to the baby's first word, she has not only acquired receptive knowledge of many words but gained skill at interacting through vocalization and nonverbal communication. In other words, the language learning skills are primed and ready to begin a phase of rapid word learning. By 18 months, a child typically produces 50 words and by 30 months she likely has 350-650 words in her expressive vocabulary (Fenson et al., 1994). This growth spurt is followed by a slower yet steady increase in the lexicon of young children. By 3 years of age, most children have finished their vocabulary spurt and the rate of vocabulary growth has been established for these young learners (Fernald, Pinto, Swingley, Weinberg & McRoberts, 1998; Henrichs, et al., 2011; Rowe, et al., 2012;) and this rate of growth is

expected to continue well into elementary school (Hart & Risely, 2003; Rescorla, Ratner, Jusczyk & Jusczyk, 2005). According to Beimiller (2005), between ages 1 and 7 years an average child gains 2.4 words per day, but a quarter of children show much slower rates of vocabulary acquisition gaining only 1.6 words each day. The cumulative effect of this slower rate of vocabulary acquisition is dramatic. By second grade, the average student has a vocabulary of 6,000 words, but 25% of second graders have only 4,000 words in their vocabulary.

The types of words in an early lexicon change throughout the first years of life. The earliest words consist of relational and social words, which emphasize the importance of the quality of parent-child interaction in word learning (Valloton, Mastergeorge, Foster, Decker & Ayoub, 2017). As noted earlier, a growth spurt takes place in the second year of life and the child adds nouns, verbs, and adjectives to her vocabulary. By 3 years of age, the child's vocabulary is balanced with a variety of word types (Kauschke & Hofmeister, 2002). While it has been observed that nouns dominate the lexicon of 2-year olds (Rescorla et al., 2017; Golinkoff, Mervis, & Hirsch-Pasek, 1994), the child's verb lexicon catches up by 30 months and shows a similar rate of growth as the overall vocabulary (Hadley, Rispoli, & Hsu, 2016). The sequence of vocabulary acquisition before age 3 follows a general order and is largely impacted by the young child's interaction partners. This early vocabulary consists of all word types but is limited to words commonly used in the child's environment as words are learned through interaction with conversation partners. Beimiller (2005) showed that a diverse population of children from preschool through grade school acquired words in a similar sequence indicating a core vocabulary. This core vocabulary contains words that

students hear and even see in print frequently because these word meanings are in common use, whereas the sequence of vocabulary acquisition is also due to natural constraints that easier words must be learned before more advanced words are acquired (Biemiller & Slonim, 2001).

Aspects of Word Learning

Word learning is an early milestone in language learning and considered the first verbal language skill that the baby demonstrates. Semantics is the language domain responsible for the content of the message. The other language domains are form, which includes phonology, morphology, and syntax, and pragmatics, or the way in which language is used. While the baby may show signs of phonology in early vocalizations and pragmatics through eye contact and smiles, the more complex aspects of language, morphology and syntax, are still out of reach. In contrast, semantic knowledge begins developing in infancy. Word learning is a complex task especially for the infant, who is still learning how to acquire new words. She hears the word in a sentence and extracts the new word from the stream of sounds making up the sentence. She then holds the new word in memory, while determining the referent, or item that the word refers to, in the environment (Tsui et al., 2019). At that point the association between the word and referent has been established. The word learning process continues and progresses in stages. Each aspect of this process is vital. Looking at the process in sequence, first, the auditory stream is segmented to extract the new word. Segmenting is a means of taking the stream of speech sounds and finding the new word. To parse the stream of speech, the infant uses auditory perception and speech processing. Early mastery of this skill is required for vocabulary development. Plunkett (1993) found that this process of

segmentation was mastered just prior to the vocabulary spurt. Segmentation theory (Boada & Pennington, 2006) proposes that phonological skills increase over time and aid vocabulary growth. After the word is identified, it is held in working memory, where it is encoded and compared with other knowledge (Gillam, 2002). Baddeley (1997) discussed the "phonological loop," a specialized device for verbal memory, which holds and rehearses the phonological representation of the new word to avoid decay of the word by keeping it active. Current research supports the concept of a specialized phonological memory device as fundamental to word learning (McQueen, Eisner, Burgering & Vroomen, 2019). The next step in word learning is matching the referent to the new word held in working memory. Carey (1978) proposed "fast-mapping," where the child initially assigns the word to a referent. For instance, when the child encounters a new item and the label for that item, the word is fast-mapped. The meaning of the word from the initial exposures to the novel word is very limited in the information that is semantically encoded. At the same time, this initial entry into the lexicon is essential so that the novel word can then be further refined through future exposures adding more semantic information.

Dale (1965) first suggested four stages of word learning for school-aged children. Initially, the word is unknown and then after 1-4 exposures the new word is assigned to a referent, or fast-mapped, whereby it can be recognized when heard again. In the third stage, the listener is exposed to the word 5-14 more times and expands word knowledge within a limited context and gathers more semantic information for the lexeme. At this time, the new word is used expressively to a limited extent. Finally, with as many as 21 exposures to the new word, it is fully understood and integrated into the expressive

vocabulary. Although these stages referred to word learning in older students, the process of word learning appears to follow a similar course in younger learners. Similarly, Beck, McKeown, and Omanson (1987) proposed five levels of words knowledge:

1. Null, or no knowledge of the word
2. Connotative, or a general sense of the word
3. Contextual, or word knowledge limited to a specific context
4. Circumscribed, or knowing the word but production limited by recall and context
5. Decontextualized or a deep knowledge of word's meaning and able to recall and produce the word in a variety of contexts.

Initially, there is no knowledge of the word. Then after limited exposure, a general sense of the word is gained and its meaning is fast-mapped and ready for recall. At the next exposure, the word is known in a narrow sense and in a limited context. The word is then known receptively, recalled in limited contexts. Then at the fourth stage the word is produced in limited contexts as the word meaning is gradually expanded and generalized to other meanings and contexts. Finally, the word and its meaning are used expressively in a variety of contexts. This final level includes the decontextualized word meaning or definitional knowledge.

The process for word learning has informed researchers' conceptualization of the lexical system as being made up of three distinct levels. The lexeme level consists of phonological representation only, while, at the lemma level, the word is encoded with semantic and syntactic information. The concept level is where both aspects of word

knowledge are consolidated, and the new words are in the lexicon (Gray, 2004). Therefore, word learning begins with the phonological representation and is followed by semantic and syntactic encoding. For young children, the skills of word learning are being honed as they are building their lexicon. It is not surprising that 14-month old infants show weaker phonological representation skills than 20-month-old children (Pajak, Creel, & Levy, 2016). In addition, a strong correlation was found between this phonological short-term memory and expressive vocabulary in 24-30 month-old children (Newbury, Klee, Stokes & Moran, 2015). When the skills necessary for phonological representation are gained, fast-mapping at the lexeme level can be achieved efficiently freeing up memory and cognition for assigning the referent using semantic and syntactic cues (Marchman & Fernald, 2008). These findings are consistent with the onset of the vocabulary spurt when young children show a rapid increase in their lexicon between 18-30 months of age (Li, Zhao, & MacWhinney, 2007).

Aspects of semantic information are added to the lexeme with multiple exposures to the new word. The type and timing of lexical exposure has been examined to determine how word learning is impacted. Not surprisingly, shorter words presented more frequently are more readily added to the lexicon (Li et al, 2007). Throughout development, increased exposures assist all learners in acquiring new words (Rice, Oetting, Marquis, Bode & Pae, 1994), while providing semantic information about the new words improved word comprehension (Gray, 2004; Henderson, Weighall, & Gaskell, 2013). Interestingly, when two-year-old children learn a concept, such as “the sun is hot”, s/he relies heavily on training context to learn the new fact. In contrast, the two-year-old learning a new word relied less on the training context needing only a new

item and referent (Tippenhauer & Saylor, 2019). These findings provide evidence that the two-year-old child is fully engaged in the stage of rapid word learning, called the vocabulary spurt, and has acquired the skills to learn new words quite rapidly. It may also signal that the two-year old has acquired the strong phonological representation skills that are foundational to the vocabulary learning process and begins focusing on semantic tools. Recently, Barbosa, Cardoso-Martin, and Echols (2016) showed that despite fragmented language input, young children (9-18 months) are quite adept at using linguistic structure as a tool for word learning. Furthermore, the semantic abilities of preschoolers have been found to be highly associated to their skills in grammar rather than phonology (Anthony, Davis, Williams, & Anthony, 2014). Such findings support the idea that word learning skills perform independently of prior semantic knowledge. In one study, Horton-Ikard and Weismer (2007) used a simple fast mapping task to show that young children (30-40 months) from low SES households, who had depressed receptive vocabulary scores, demonstrated new word learning skills commensurate with their peers with larger vocabularies from middle SES families. Meanwhile, a similar study using a more complex fast-mapping task showed that children, specifically those from low SES households, learn new words using grammatical as well as semantic information (Spencer & Schuele, 2012). Such studies indicate that children from low SES households, who possess smaller lexicons, do not have impaired word learning skills. In fact, these students with intact word learning mechanisms may simply need vocabulary stimulation to increase word learning prior to school entry.

Preschool is a pivotal time for language development

As the name indicates, preschool is an educational experience that comes before entry into school or kindergarten. For many years the preschool experience was reserved for children from middle to upper income households because of the cost. The Head Start program was established in 1965 to provide a high-quality preschool experience to children from families with low-income free of charge. Preschool children are between the ages of 3 and 4 years old and exposed to a learning environment that is designed to be enriching and to prepare the young child for school entry. Unfortunately, some children enter kindergarten not fully prepared for formal schooling. Moreover, those students entering school with poor language skills, especially vocabulary skills, usually do not catch up with their peers (Tabors, Snow, & Dickinson, 2001; Johnson, Beitchman & Brownlie, 2010; Beitchman, et al., 2008). Fortunately, language ability is not fixed at age four years and intervention can improve these important language skills (McKean et al., 2017). Simply supporting oral language development in preschool has shown to increase school readiness (Whorall & Cabell, 2016). Moreover, attending preschool for more than one year is better for children from low SES households. Jenkins, Farkas, Duncan, Burchinal, & Vandell (2016) found that 3-year-old preschool children attending a Head Start program showed stronger pre-reading skills than those preschoolers who only attended at 4 years of age. Furthermore, preschoolers from low SES households provided with language intervention in the classroom demonstrated increased decoding and reading comprehension skills in kindergarten (Johanson, Justice, & Logan, 2016).

Vocabulary Gap

The vocabulary gap, also referred to as the word gap, is a difference in word knowledge and word use evident in children from low SES households compared to peers from more affluent families (Hindman, Wasik, & Snell, 2016). In the United States it is estimated that 22% of children live in poverty, which represents the lowest end of low SES households. Many more children are included in the low SES population. The two major factors of SES that impact a child's language are income level and parental education (Hoff, 2013). Naturally, parental education and family income are closely linked. Furthermore, when a parent gains more education a commensurate increase in the family income typically follows. As far as the impact on the child, a higher household income impacts the child's access to material resources. Parents with higher education are also thought to provide nonmaterial resources such as an increased quality of talk time or attitude toward the child's education (Entwisle & Astone, 1994). Still a number of studies have tried to parse these two elements of SES and determine which element has a greater impact on a child's vocabulary development. A re-analysis of Hart and Risley's (1995) and Hoff's (2003) studies found that parental education was more highly correlated with verbal ability than family income (Rindermann & Baumeister, 2015). Longitudinal studies showed that household income is a major factor in vocabulary growth from ages 5-25 years, while until age 5 parental education has a significant impact on vocabulary growth (Beitchman et al., 2008; Sohr-Preston et al., 2013). While these two aspects of SES are interrelated, they are easily captured on a questionnaire in a dollar amount or a grade in school. However, the actual impact of parental education is more difficult to quantify. This is the language that the child is exposed to, or the

language input. The language used in the home of a young child has a direct impact on the young child's language development. Hart and Risely (1995) measured both the quantity and diversity of language input by quantifying the number of utterances and different words the parent used when speaking with their child and found a large disparity across income groups. Although the study primarily used household income to denote SES, this measure was found to be highly correlated with maternal education and with the diversity of the child's vocabulary (Dollaghan et al., 1999). Furthermore, Pan, Rowe, Singer, and Snow (2005) analyzed maternal input compared to their children's vocabulary growth between 14 and 36 months and found that the quality of the maternal language such as the diversity of vocabulary use and the mother's language and literacy skills were positively correlated to the child's vocabulary, whereas the quantity of talk was not found to be related. When looking at maternal speech, Hoff (2003) compared vocabulary growth in children (16-30 months) by SES, measured by parental education, and found that young children from families with high SES gained more vocabulary in 10 weeks than their peers with mid-SES. This gain in lexicon was attributed to aspects of maternal speech. In particular, the increased length of utterance in the speech of mothers with high SES allowed their children to gain more lexical knowledge than the children who heard shorter, less complex sentences. Language input is measured by the language the parent uses when interacting with her young child and reflects to a large degree the mother's educational level.

This discrepancy in vocabulary skills between children from low SES households and their more affluent peers is evident at an early age and due to the cumulative nature of vocabulary skills and will persist well into grade school (Hart & Risley, 2003; Walker,

et al., 1994). When a child enters kindergarten, she begins the process of learning to read wherein the young student draws on her oral language skills to assist in the mastery of written language. Lexical knowledge consists of a phonological representation as well as the semantic and syntactic knowledge for each word. Initially, when a student encounters a new word when reading she decodes the word. Young readers often sound out new words comparing the phonological representations already in the student's lexicon. When the new word matches a word that is already in the lexicon, the associated semantic and syntactic information is accessed, allowing comprehension of the word in its written form. In contrast, when the young reader encounters a word that is not in the oral lexicon, no phonological representation, semantic or syntactic information is available. Comprehension of the written text becomes more difficult when the word cannot be retrieved from the lexicon. Therefore, it is not surprising that the size of the young readers' vocabulary influences their phonological awareness and decoding skills (Edwards, Beckman, & Munson, 2004; Wise, et al., 2007) and that preschool vocabulary is a significant predictor of word reading skills in the early elementary grades (Catts, et al., 2001; Rinaldi & Páez, 2008; van Viersen et al., 2017). Kindergarten vocabulary skills were found to be predictive of phonological awareness and listening comprehension in first grade and later reading comprehension and fluency (Sénéchal, Oullette, & Rodney, 2006). Moreover, vocabulary knowledge impacts reading comprehension in later grades at both the text and sentence level. Students from low SES households show diminished reading comprehension skills well into middle school due in part to limited vocabulary skills from an early age (Oslund, Clemens, Simmons, Smith, & Simmons, 2016). Unfortunately, the impact of low language skills prior to school entry

is not limited to reading. Low language skills have been associated with depressed academic achievement, reduced levels of education, and poor occupational outcomes (Johnson, et al., 2010). Furthermore, this achievement gap is well-documented and a major predictor is SES (Patterson, Kupersmidt, & Vaden, 1990). Projects, such as Suskind's Thirty Million Words initiative (2015), are underway to help families understand the critical importance of early language exposure in closing the vocabulary gap.

In sum, the exact cause of the vocabulary gap is unknown but two aspects of SES, family income and parental educational level, strongly influence a child's vocabulary development. Furthermore, the quality of language input the young child is exposed to impacts vocabulary development. The gap in early language skills is evident as early as 18 months of age and persists into the school years and beyond. Deficits in vocabulary give rise to reduced reading skills. Poor reading skills impact most academic areas bringing about a gap in achievement between low and high SES students.

Types of interventions

Shared storybook reading.

Shared storybook reading is a favored intervention for increasing language skills in young children. This intervention involves an adult and a child or children reading the storybook together and viewing the pictures. It has the advantage that storybooks are engaging for children providing pictures to aid comprehension and attention to the page. Reading a storybook with a child is a means of teaching early literacy skills, such as print awareness, narrative skills, and the motivation to engage with books. Many children first engage in the storybook reading experience with their parent at home. For many children

this is a familiar routine when parent and child spend time together while reading the story. According to Blewitt and Langan (2016) how the adult engages the child during the reading impacts the child's word learning. In these one-on-one sessions, forty 3-and 4-year-old children from mid to high SES households were read a story using different levels of engagement; low, moderate or high. During the low-engagement condition, the reader made comments and repeated the target words. For the moderate engagement condition the reader repeated the target words in questions and allowed the child to point to the pictures. In the high-engagement condition, in addition to the questions and pointing, the reader increased responsiveness to the child. Students in the high-engagement condition showed greatest gains in stating the definition of the target word and receptive vocabulary knowledge when the adult was more responsive during shared book reading. Sharif, Ozuah, Dinkevish, and Mulvihill (2003) found that all children saw gains in receptive vocabulary, however the children whose parents had higher levels of education saw greater gains in vocabulary. In their study, van Kleeck, Gillam, Hamilton, and McGrath (1997) found that shared book reading with middle class parents showed gains in the abstract language of their preschool children. Additionally, Meng (2016) found that preschool children from low SES households also gained in receptive vocabulary skills when the parent and child engaged in shared book reading in the home. Unfortunately, numerous studies have shown that in most low SES households the home literacy environment provides few shared book reading opportunities (Mol, 2011).

Using the parent-child shared book reading intervention, Horst, Parson, and Bryan (2011) found that 3-year-old children showed increases in immediate and delayed recall of new vocabulary words when the storybook was read more than once. Many

studies have shown that multiple readings of the same book increased receptive vocabulary learning (Robbins & Ehri, 1994; Zucker, Cabell, Justice, Pentimonti, & Kaderavek, 2013) largely because repeated readings increased the number of exposures to the new vocabulary. Sénéchal (1997) found that multiple readings of a storybook was superior to a single reading. Furthermore, Robbins and Ehri (1994) showed that the incidental learning through shared storybook reading on its own improved the vocabulary skills of nonreaders. Kindergarten students who heard the words during the story reading demonstrated significant vocabulary growth, while receptive vocabulary assessment of words not heard in the story remained at chance levels. This study also found that a minimum of four exposures to the word was necessary for kindergartners to learn the new words from context. Elley (1989) found that with repeated readings the children showed a vocabulary increase of 15% but when the new words were presented with an explanation, the children saw an increase of 40% in word learning. In other words, receptive vocabulary knowledge is increased when an adequate number of exposures to the new word in a meaningful context are achieved through shared book readings. Moreover, when young children are engaged in dialogue during shared storybook reading and are provided opportunities to produce the new vocabulary word, their expressive vocabulary skills increased (Sénéchal, 1997), indicating that interaction within the shared storybook reading may increase expressive vocabulary skills.

Interactive storybook reading.

Traditionally, during the storybook read aloud the young child sits passively and listens to the story told by the adult. The child learns new words incidentally via the storybook reading. A more engaging type of shared book reading designed to teach

vocabulary skills is called interactive storybook reading (ISR). Wasik and Bond (2001) identify three essential elements of ISR as, first, selecting target vocabulary and providing repeated exposures to those words. Second, the target words must be salient to the learner through the verbal presentation by the reader and/or the visual illustrations in the book. Finally, the adult reader uses strategies such as open-ended questions and interactive prompts to engage the child in discussion about the new words. When an adult shares a book with a child and actively engages the preschool-aged child in talk about the text, the child has the opportunity to hear and use the new vocabulary words. Moreover, when the adult engages the child in the story through questions and pointing to the pictures, the child learned more words than when the adult simply provided comments and repetitions of target words (Blewitt & Langan, 2016). In addition, the type of talk about the book assists the child in vocabulary learning. Contextualized talk includes labeling and describing items pictured in the book. Decontextualized talk, on the other hand, includes topics not contained in the book such as asking the child to predict what will happen next or relating the book to the child's own experience. Hindman, Erhart, and Wasik (2012) observed Head Start teachers use of these two types of book talk and assessed vocabulary skills of 153 preschool students at the start and the end of the school year. They found that when the teachers used both contextualized and decontextualized talk in the Head Start classroom the students showed increases in vocabulary learning. Moreover, students starting the year with low vocabulary skills showed the greatest gains in receptive skills when they were exposed to contextualized book talk.

With ample exposures to new vocabulary words through repeated readings, increases in receptive vocabulary were noted (Blewitt & Langan, 2016; Horst, et al., 2011; Robbins & Ehri, 1994). Receptive knowledge of the word is gained through listening, while expressive vocabulary is gained through producing the target vocabulary word. Sénéchal, Thomas, and Monker (1995) found that when the child produced responses to comprehension or labeling prompts for the novel word, that child showed not only receptive but also expressive knowledge of that word. Moreover, the more the child produced the new word, the greater the increase in their receptive identification and their expressive labeling of the new word. Interaction with the storybook reading is clearly advantageous for vocabulary learning, especially learning the expressive use of the new word. Interactive strategies such as sentence completion (cloze procedures), questions that elicit the label, and comprehension questions allow expressive use of the target word increasing vocabulary skills (Kaderavek & Justice, 2002). Additionally, ISR has been shown to increase receptive and expressive vocabulary skills in 4-year-old children from low SES households (Zucker, et al., 2013).

Dialogic reading intervention.

A similar yet more scripted method of interacting with children about a story book is called dialogic reading. Dialogic storybook reading focuses on the interaction between the adults and the child during the reading. Child-directed talk was used to engage the child in a dialogue about the book. The focus of the dialogic reading technique was to provide parents the clearly defined procedures to enhance the interaction with their children during storybook reading. When dialogic reading was found to increase verbal interactions (Brannon & Dauksas, 2012) and literacy skills

(Pillinger & Wood, 2014), it was embraced as more than an early intervention tool. More recently teachers have been trained in dialogic reading techniques for use in their preschool classrooms. While the technique was designed for the one-on-one situation of the parent-child dyad, it has proven effective in expanding language skills in preschool classrooms (Rahn, Coogle, & Storie, 2016; Opel, Ameer & Aboud, 2009). Dialogic reading techniques have provided teachers with a structured means of interacting with the students. Unfortunately, the amount of actual talk time the child is allowed is reduced as the number of students increase. With a group size of 5 or 6 students the talk time for each child is significantly less than the one-on-one situation for which it was designed (Huebner, 2006).

Dialogic reading was first discussed in Whitehurst et al. (1988), where techniques for reading with young children (2-3 years) and preschoolers (4-5 years) were outlined. For both groups of children, techniques focus on engaging the child in the story using a variety of evocative prompts, which promote a dialogue between the adult and the child about the storybook. For the preschool-aged students, the specific prompts include completion prompts, or the cloze technique, where the adult lets the child complete the sentence. A variety of question prompts are used including "wh" questions, open-ended questions, and questions that require the student to recall information. A final type of prompt used in dialogic reading relates the story context to the child's life. Different prompts are used in different parts of the story and depend on the child's level in the progressive steps toward full comprehension of the story and words. The adult provides evaluative feedback on the child's responses using praise or modeling as necessary. The

adult also expands the child's response and allows the child to repeat the expansion (Zevenbergen & Whitehurst, 2003).

Aspects of Vocabulary Intervention

There are two general means for learning new vocabulary: implicit and explicit. Students and adults learn new vocabulary words implicitly by inferring the unfamiliar word's meaning from the context. Deducing the word's meaning is implicit, whereas when the word meaning is provided through a definition or synonym the instruction is explicit. Vocabulary lessons that focus on teaching new words have been a part of the earliest school curriculums. Typically, vocabulary lessons have been designed for third graders or above (Biemiller, 2006) who can read a text and analyze the word in context. In these lessons, synonyms or definitional meanings are provided to teach the new vocabulary word.

Explicit vocabulary intervention.

For younger children or poor readers, direct vocabulary instruction has employed the read aloud with a brief explanation of the target word. This is called explicit vocabulary instruction and has been shown to be effective in teaching vocabulary words to fourth grade students (Brett, Rothlein, & Hurley, 1996) as well as students between 5 and 8 years of age (Penno, Wilkinson, & Moore, 2002). In addition, explicit vocabulary intervention was shown to be effective in increasing word knowledge of first grade students from low SES households (Sobolak, 2011).

While these methods were derived from how older students learn new words, similar procedures are used with younger students. Christ and Wang (2011) completed a review of the literature and concluded that three types of vocabulary instruction are found

in the preschool classroom. Methods include simply exposing children to more advanced vocabulary, providing direct instruction on word meanings, and a combination of methods. For preschool students the rich context for word learning is usually provided by the storybook. The picture book provides not only the story context, but is visually enhanced through the illustrations providing both a visual and literary context for word learning.

Word selection.

Choosing words to teach is an important component of a successful intervention. Beck, McKeown and Kucan (2002) propose a three-tiered classification system for words based on their utility and frequency of use. Tier one consists of common words used in everyday conversation. There is little need to teach words that are commonly encountered by the preschool child and are likely already known. Conversely, words that are highly specific and used very infrequently, tier three words, are of limited utility to the preschool child. Consequently, tier two words are selected for instruction that are typically more specific yet still used frequently across various subject matter. Additionally, the words selected should be important to the story or topic. Tier two words are targeted because they are usually new to the student and more advanced than the tier one vocabulary words which are likely already familiar to the student (Justice, Schmitt, Murphy, Pratt, & Biancone, 2014). Teaching tier two words to preschool students is consistent with the work of Biemiller (2005), who viewed these words as the foundation necessary for learning the more advanced words that students need in elementary school. These words are valued for their instructional potential and considered an important part of academic language.

Explicit versus implicit vocabulary intervention.

According to Hindman and Wasik (2006), to provide effective vocabulary intervention one must follow these five important steps. One, during book reading, draw the child's attention to the new word by using it multiple times. Two, the reader must provide the child with the word meaning by giving a clear explanation of the word. Three, to help the child remember the new word the adult can relate the word to the child's own experience and provide the connections. Four, in the process of learning the new word, the child must have opportunities to use the new word in meaningful ways. Five, because word learning is incremental and not static, the adults must repeat these steps to allow the child multiple exposures and opportunities to gain the lexical knowledge to add the new word to their vocabulary.

The principles of vocabulary instruction according to Hindman, Wasik and Snell (2016) are based on word learning and instructional methods used in the classroom. Vocabulary instruction simply expands on the way many words are learned which is incidentally. Incidental word learning is implicit by nature, where the meaning is understood in context and not explicitly stated. In implicit learning, the student hears the word in context and is able to infer the meaning of the new word. This initial mapping of the new word meaning is incomplete and with subsequent exposures to the new word the mapping is extended to a fuller meaning of the word in context (McGregor, Sheng, & Ball, 2007). Explicit vocabulary intervention draws the child's attention to the unfamiliar word by labeling it within context. Meaningful context for the new word is provided through a storybook and the meaning is given verbally (Justice, Meier, & Walpole, 2005). In explicit intervention, multiple exposures to the word are targeted because it has

been shown to increase word learning (Elley, 1989; Penno et al, 2002). In addition, learning new words requires a rich semantic context from which the learner takes clues to enhance the vocabulary knowledge. When the new word is related to the learner's life, it is more readily understood and retained. Furthermore, providing the word meaning to the learner jump starts the word learning process. This is also called explicit instruction and skips the inferred meaning step, which can delay word learning (Ehren, 2002). Lastly, producing the new word and being given feedback on production accuracy aids the learning of it (van den Broek, Takashima, Segers, & Verhoeven, 2018). Damhuis, Segers, and Verhoeven (2014) compared the effects of implicit and explicit vocabulary instruction and found that with explicit instruction kindergarteners showed increased depth of word learning and students retained the newly acquired words. Furthermore, children with low vocabulary skills improved in word learning when provided explicit vocabulary instruction (Nash & Donaldson, 2005).

Explicit vocabulary intervention embedded in ISR.

Neuman and Dwyer (2009) examined the methods of vocabulary instruction and outlined the essential elements of explicit vocabulary instruction in the preschool classroom. They found that the selection of specific vocabulary words is essential. In addition, the meanings of the new words need to be taught to the students within a meaningful context. Lastly, the preschool students should be provided opportunities to practice the new words while demonstrating comprehension. These methods fit quite neatly with the methods of the ISR as outlined by Wasik and Bond (2001). In interactive story reading, target words from the story are selected and multiple exposures to each of the target words are provided. During the reading, the new words are made verbally or

visually salient. The reader uses verbal stress on the target word to bring the students' attention to the word. The reader may also draw the students' attention to the pictures in the storybook representing the target word. Lastly, the reader prompts the students with open-ended questions allowing the students opportunities to practice producing the new word.

Combining the ISR with explicit vocabulary intervention potentially provides an even more powerful tool for young children to learn new words. The storybook provides the meaningful context for the new words. The explicit instruction is embedded into the meaningful context when the child-friendly word meaning is provided within the storybook reading, allowing the child to use the context to enhance comprehension of the new word. Explicit instruction provides a brief definition with repeated exposures. Biemiller and Boote (2006) examined the effectiveness of this approach and found that students in primary schools showed a significant gain (22% increase) in word knowledge with embedded instruction and even greater gains (41% increase) in new words with increased exposures to the word meaning in new contexts.

Low SES and vocabulary intervention.

A review of the literature conducted by Marulis and Neuman (2010) examined methods for teaching vocabulary words across 67 studies. They found that the greatest gains in preschool word learning were made implementing explicit vocabulary intervention by well-trained instructors. There was no significant difference in vocabulary gains attributable to the size of the group, the intensity of the instruction, or the duration of the intervention. The author's meta-analysis showed that certain students showed greater increases in word learning. They found that the benefits of vocabulary

intervention were strongest for students with middle-to-high income, while students with low SES or other risk factors benefited less from these vocabulary interventions. In order to affect the greatest gain in students from low SES households who exhibit low vocabulary skills, interventions especially targeting this population are needed. For this reason, studies that assessed the effect of the intervention on children from low SES households were examined to discover the most effective interventions for this population. Shared book reading and book talk consisting of discussing the book after the reading positively impact both short- and long-term vocabulary learning in the children from low SES households (Dickinson & Smith, 1994; Gonzalez et al., 2014). In addition, repeated readings and explicit vocabulary instruction embedded in the storybook increase word learning in kindergartners with low vocabulary skills (Nash & Donaldson, 2005). Small group intervention implementing IRS with preschoolers from low SES homes was effective in increasing word learning (Hargrave & Sénéchal, 2000; Wasik & Bond, 2001). Moreover, Nash and Donaldson (2005) found that students with low vocabulary skills saw the greatest increase in word knowledge with explicit vocabulary instruction, while all learners gained words when provided increased exposures to the new words.

The tools of vocabulary intervention that are effective for preschool-age children are not necessarily as effective for students coming from low SES households. In examining the literature for the intervention tools most effective for this population, a number of techniques are shown to have merit. Engaging the child in a shared book reading in the meaningful context of the storybook is vital to language learning, especially the preschool aged child. Furthermore, multiple readings with explicit

teaching of the new word meanings within the storybook context positively impact word learning. Lastly, the small group setting, which allows each child more active participation, is more effective than whole classroom instruction.

Summary of the literature review.

In summary, the vocabulary gap between children from high and low SES households has been shown to develop early and persist well into school, impacting reading development and academic achievement. Successful intervention should be provided in the preschool years to enhance vocabulary learning before school entry. Direct vocabulary instruction has been shown to be effective with young children who have depressed vocabulary skills, while interactive story reading intervention with word meanings has been shown to be effective in increasing vocabulary skills with children at-risk for language deficits. For this reason, this study will examine whether combining the interactive storybook read aloud with embedded, explicit vocabulary intervention provides a powerful tool for teaching vocabulary to young children who are at risk for vocabulary deficits. Unfortunately, the effects of vocabulary intervention with preschool aged children from low-SES households are not well understood. Therefore, the aim of this study is to determine the effectiveness of the storybook read aloud with embedded vocabulary intervention on vocabulary skills of preschool students from low-SES households.

The current study addressed the following research questions:

(1) Is explicitly teaching vocabulary during interactive storybook reading associated with changes in receptive vocabulary?

(2) Is explicitly teaching vocabulary during an interactive storybook reading associated with changes in semantic (word meaning) knowledge?

(3) Is explicitly teaching vocabulary during an interactive storybook reading associated with spontaneous use of taught vocabulary words?

Based on these questions, the following hypotheses were developed:

(1) Preschool students engaged in explicit vocabulary intervention during an interactive storybook reading will increase receptive vocabulary knowledge of the target words as measured by the *Comprehension Probe*.

(2) Preschool students engaged in explicit vocabulary intervention during an interactive storybook reading will increase semantic knowledge of the target words as measured by the *Definition Probe.*

(3) Preschool students engaged explicit vocabulary intervention during an interactive storybook reading will spontaneously produce target words during a story retell language sample.

Chapter III

METHODOLOGY

This study was approved by the Valdosta State University Institutional Review Board on August 2, 2019, before the recruitment of participants (see Appendix A). The study was conducted at the Lowndes 1 Head Start in Valdosta, Georgia. The median family income for Lowndes County is $38,915. The poverty rate for this region is 30.5%, which is higher than the national average (Coastal Plains Area Head Start, 2016). Lowndes 1 Head Start was founded in 1969 and provides free quality child care for children 3-5 years of age. Families that qualify for Head Start programs show income levels below the poverty line, which is currently $25,750 annually for a family of four (Health and Human Services, 2019).

Participants

The primary inclusion criteria were that the students were 4 years of age and came from low SES households. Three classrooms at the Lowndes 1 Head Start were identified that served 4-year-old students. Two classes contained only 4-year-old students, while the third contained both 4-and 3-year-old students.

Head Start health forms were reviewed to determine whether participants had passed hearing and vision screenings upon enrollment. No participants had a known diagnosis of severe cognitive impairment, autism, sensorineural hearing loss, vision difficulty, or traumatic brain injury. In addition, parents of participants reported that

English was spoken in the home. Participants received no speech and language services prior to the time of the study.

All eligible students from the three classrooms, who were at least 3 years and 11 months old at the beginning of the study, were provided a Permission for Child Participation in Research form and invited to participate in the research (see Appendix B). Twenty-seven assent forms were completed and returned. One student was disqualified due to speech and language treatment and two students moved during the study and were no longer enrolled at Lowndes 1 Head Start. The 25 participants who met all the eligibility criterion were assigned a participant number. Using a random number generator, participants were randomly assigned to either the treatment or the control condition.

Descriptive data was collected from Head Start records including each participant's age, the mother's highest level of education and head of household status. To assess overall vocabulary knowledge before the start of the intervention, each participant was administered a standardized test of expressive vocabulary, *Expressive One-Word Picture Vocabulary Test- Fourth Edition* (EOWPVT-4) (Martin & Brownell, 2011a), and receptive vocabulary, *Receptive One-Word Picture Vocabulary Test – Fourth Edition* (ROWPVT-4) (Martin & Brownell, 2011b). The standard score was calculated for each participant, where scores between 85 and 115 indicate skills within the average range. In Table 1 the descriptive data for the control group is presented.

Table 1

Descriptive Data for Control Group

Gender	Age (in Months)	EOWPVT (SS 85-115)	ROWPVT (SS 85-115)	Maternal Education (years)	Head of Household
m	50	91	85	12	Single-mom
f	57	99	92	12	Single-mom
f	47	83	103	8	Single-mom
f	47	79	94	12	Single-mom
m	47	96	118	14	Single-mom
m	59	80	106	12	Married
f	54	118	101	12	Single-mom
m	59	109	107	8	Single-mom
m	50	96	80	12	Single-mom
m	53	101	124	12	Single-mom
m	59	91	88	12	Single-mom

In Table 2 the descriptive data for the treatment group is presented.

Table 2

Descriptive Data for Treatment Group

Gender	Age (in Months)	EOWPVT (SS 85-115)	ROWPVT (SS 85-115)	Maternal Education (years)	Head of Household
f	57	87	103	11	Single-mom
m	57	96	90	11	Single-mom
f	48	118	118	13	Single-mom
f	56	103	95	11	Single-mom
m	48	97	100	11	Single-mom
m	57	85	92	8	Married
m	59	82	113	12	Married
m	52	73	84	11	Single-mom
f	59	101	117	14	Single-mom
f	50	85	89	12	Single-mom
f	59	78	109	12	Single-mom
m	53	77	85	12	Single-mom
f	54	93	98	12	Single-mom

In this study there were thirteen participants in the treatment group and eleven participants in the control group[1]. The descriptive information from the two participant groups revealed that the groups are similar. The mean chronological age of the participants in the control group was 53 months and 54.5 months for the treatment group. Both groups' mean maternal education in years was 11.5 years. The majority of households in both groups were headed by a single mother. Similarly, no difference in receptive vocabulary knowledge was noted. For receptive vocabulary (ROWPVT), the mean for the treatment group was 99.5 (range of 85-118) and the control group's mean was 99.8 (range 80-124). For the expressive vocabulary measure (EOWPVT), the treatment group had a mean of 90.4 (range of 73-118) and the control group's mean was 94.8 (range of 79-118).

In addition, a series of one-way ANOVAs were performed on the pre-experimental data (ROWPVT, EOWPVT, *Definition Probe* Total words, *Definition Probe* Intervention words, *Comprehension Probe* Total words, and *Comprehension Probe* Intervention words) to establish homogeneity between groups. No significant differences were found between groups on any variable.

Materials

Vocabulary measures

To assess receptive and expressive vocabulary knowledge of the 10 target vocabulary words researcher-developed vocabulary probes were conducted. Each probe

[1] SPSS analysis identified a single participant's data in the control group as an outlier. Further statistical analysis revealed this participant's performance so extreme as to warrant removal from the data pool.

was administered as a pre-test, 2 weeks prior to the start of the intervention, and then as a posttest, 2-weeks after the intervention was completed. In addition to the 10 target words, ten foils, or non-intervention words of equal complexity, were included in each probe.

Receptive vocabulary probe.

The receptive vocabulary measure was used to assess all participants' receptive knowledge of the words targeted in the storybook intervention. This measure was also given two weeks prior to the intervention phase as a pre-test and again two weeks after the intervention phase was complete as a posttest measure.

The measure was fashioned after the C*omprehension Test* presented in Blewitt and Langan (2016). In this assessment, each participant was presented with four color pictures on a page. Each page consisted of a picture for the target word, a familiar item from the same subordinate category, and two unrelated items. Of the two unrelated items one was a common item and one was a less common, and therefore unfamiliar item. The word was presented verbally and the participant was asked to point to the picture that best matched the target word. Target words were presented in one of four random orders. The item that the participant indicated was recorded on the *Comprehension Probe* form (see *Comprehension Probe* Appendix D). Accuracy was calculated for the 10 target words and the 10 foils of similar complexity, which were not presented in the storybooks during intervention.

Semantic knowledge vocabulary probe.

The semantic knowledge vocabulary measure was used to assess all participants' expressive knowledge of the words targeted in the storybook intervention. It was given

two weeks prior to the intervention phase as a pre-test and again two weeks after the intervention phase was complete as a posttest measure.

This researcher-designed vocabulary measure was first described in Blewitt and Langan (2016). The *Definition Probe* was administered to assess semantic knowledge of the 10 target words and an equal number of foil words of similar complexity that were not present in the storybook. The 20 words were presented in random order. Each participant was verbally asked to tell the stuffed animal, Sam, all that s/he knew about the word. The examiner said "can you tell Sam what a [word] is?". After the initial response, the examiner asked, "What else can you tell Sam about [word]?". Each verbal response was written on the *Definition Probe* form (see *Definition Probe* Form, Appendix C). All responses were assigned a point for each informational unit provided. The informational units were function, superordinate category, synonym, perceptual feature, and any parts of the whole labeled. Each new informational unit provided an opportunity for additional points for each word making the score on this measure unlimited.

Language sample.

After the intervention phase was completed, a language sample was collected from each of the participants in the treatment group. The language sample consisted of a story retell for each of the storybooks and was collected within a week of the intervention for that story. Only a single story retell was collected in a sitting.

The participant and the researcher sat together at a table looking at each of the storybooks presented in the intervention phase. The researcher told the participant that she forgot the story and needed help to know what happened. As the researcher turned

the pages of the storybook, she elicited the story retell with the prompts of the language sampling protocol (Westerveld, Gillon, & Miller, 2004). The researcher prompted the participant to look at the pictures and tell as much of the story as possible. Prompts were provided to extend the talk about the book while no target vocabulary words were discussed. The language sample was collected consisting of a story retell for each of two storybooks.

The audio recorded language samples were transcribed by the researcher. A research assistant trained in language sampling and analysis reviewed each transcript for accuracy before using Systematic Analysis of Language Transcripts (SALT) to assess the diversity of the vocabulary used during the retell. Each sample was analyzed using the SALT Student version 18 (Miller & Iglesias, 2017). Expressive vocabulary was measured using number of different words (NDW), which is a measure of vocabulary diversity in a speech sample. Additionally, the number of the target words spontaneously produced during the language sample was calculated for each participant.

Intervention materials

Storybooks.

Books selected for the vocabulary intervention were commercially available picture books. Preschool storybooks were selected that contained colorful illustrations, approximately 2-4 sentences on a page, a simple narrative, and preschool-appropriate themes unrelated to specific holidays. Selected storybooks depicted familiar themes, and introduced new words (Hargrave & Sénéchal, 2000). To the best of the researcher's knowledge, the students had limited exposure to the texts prior to the study.

For the storybook intervention two storybooks were selected that contained engaging pictures, limited but interesting text, and preschool-appropriate themes. In addition, the books were not present in the Head Start classrooms. "Who is the Beast?" by Keith Baker and "The Little Mouse, The Red Ripe Strawberry, and the Big Hungry Bear" by Don and Audrey Wood were selected.

Word targets.

A total of 5 words were selected from each storybook (Hindman & Wasik, 2006) to allow for adequate time for instruction and interaction with the new word and its meaning. These target words included nouns, verbs, and adjectives. Following the word selection criterion that was first put forth by Beck, McKeown, and Kucan (2002), the researcher reviewed each storybook and selected tier two words based on their utility to the student and level of specificity. Moreover, the target words were important to understanding the text and expanding the students' lexicon by building on the more basic or tier one words (Gray &Yang, 2015).

Five tier two vocabulary words were selected from each text and a child-friendly meaning provided. In Table 3, the target words and their child-friendly meanings are presented.

Table 3

Target words with child-friendly meanings

Who's the Beast?	
tail	The part of the tiger that swings behind him.
stripes	Lines on the tiger's back. The tiger has orange and black stripes.
round	His eyes are round. They are like a circle. They are not square.
long	The tiger has a long tail. It is not short.
whiskers	Long white hairs on the tiger's face. Hairs on both sides of his nose.

The Big Hungry Bear	
ripe	When the strawberry is red and juicy. Ripe is ready to eat.
smell	We use our nose to smell. The strawberry smells sweet.
forest	A forest is the woods. A place with trees.
hide	He hides it so you can't see the strawberry. He hides under the cloth.
half	You cut it into two equal parts. You cut it in half. He has a whole strawberry and then he cuts it in half.

Procedures

This study examined the effects of vocabulary intervention on preschool children by comparing the pre-test and posttest results on vocabulary measures for the participants under the experimental and control conditions.

Control Condition.

Participants in the control group adhered to the same inclusion criterion and were provided instruction in the Head Start classroom. The Head Start facility limits class size to a maximum of 17 students and provides a lead teacher and an assistant for each classroom. Three classrooms participated in this study. Two of the lead teachers were Black females and one was a White female teacher. The teachers of the classrooms in

this study had an average of 9 years of teaching experience. Two of the teachers earned an associate's degree and the third teacher completed one year of college.

In the classroom the *Creative Curriculum* was implemented. This curriculum focusses on social-emotional, physical, cognitive, and language development and provides 10 interest areas in the classroom such as blocks, art, library, cooking, and movement. At the beginning of the study an observation of the classroom was conducted to assess the type of book reading provided by the teacher. Story time was scheduled for a 15-minute period directly before lunch. The students sat on the carpet in a half circle facing the teacher. The teacher oriented the book to face the students while she sat beside the book. She read aloud and engaged the students in the story through both whole group and individual questions.

Treatment Condition.

Participants in the treatment group received interactive storybook reading (ISR) with embedded explicit vocabulary intervention. The treatment portion of the study took place within the context of the language group program, which is an early intervening program conducted twice a week at the Lowndes 1 Head Start. Language group uses the small group format, where each group consisted of no more than 4 participants and no less than 2 participants. The number of participants in the group is consistent with the recommended group size for vocabulary intervention (Hindman & Wasik, 2006; Whitehurst & Lonigan, 1998; Whitehurst et al., 1994). For this study the four intervention groups consisted of 3 participants each.

Treatment consisted of three 30-minute language group sessions per storybook for a total of 6 treatment sessions. Each session began with a review of language group rules

followed by the introduction of the storybook through a literacy activity. For instance, the participants were asked to make predictions about the story prior to an initial reading or recall the story sequence and characters before a second reading. During each story, ISR techniques were implemented that engaged the participants in talk about the story characters and events. When a target word was encountered, explicit vocabulary intervention was provided to teach the word meaning in context.

Intervention procedures

For the intervention phase, an interactive story read aloud was provided twice to each small group (Hargrave & Sénéchal, 2000). Explicit vocabulary intervention was embedded in the ISR providing the participants exposures to the word and its meaning within the context of the storybook (Nash & Donaldson, 2005). Multiple exposures to target words in a meaningful context have been shown to have a positive impact on word learning for students in primary school (McKeown, Beck, Omanson & Pople, 1985; Beck & McKeown, 2007). Therefore, through the three sessions of ISR with embedded explicit vocabulary intervention, the participants were exposed to the target words a minimum of 5 times and a maximum of 20 times.

The explicit vocabulary intervention included a brief definition or synonym for each target word given using the context of the story being read. On the first reading of the story, the interventionist read the story with expression, providing opportunities for the participants to interact with the story content and responding to participant's comments about the story. When the target words were encountered, the meaning or explanation of the word was presented on average five times in the session. After the word and its meaning were presented in the story, the interventionist prompted each

participant to receptively respond through gesture or pointing, showing comprehension of each target word. For example, the interventionist might say, “show me the tiger’s tail”. Correct responses were reinforced with verbal affirmation and repetition of the correct word. After an incorrect response, the interventionist prompted another participant to respond and provide a peer model. If a peer model was not possible, the correct response was provided by the interventionist.

In the next session, the same book was read again using ISR techniques. On the second reading, explicit vocabulary intervention was provided followed by verbal elicitations of the target word. As the target word was encountered in the story, the word meaning, or definition was provided. During this second reading, the target words were elicited through the dialogic reading prompts of phrase completion, relating the word to the child, or answering a wh-question. The elicitation technique varied according to the target word. Responses were evaluated for accuracy and positive reinforcement or correction was provided as needed.

For the third and final session with each storybook, the participants were engaged in a story retell activity as a group. The interventionist showed the participants the storybook cover stating that this time they would tell the story. Open-ended prompts to elicit a retelling of the story were provided as the interventionist turned the pages of the book. Prompts were provided for each of the story elements; topic, characters, setting, initiating event, continuing event, internal response, cause and effect, and resolution.

Intervention training

The language group program at Lowndes 1 Head Start is a clinical practicum site for Valdosta State University’s Department of Communication Sciences and Disorders,

where graduate clinicians are trained in preschool language intervention. The graduate students had completed a minimum of a semester of practicum prior to the Head Start placement. The graduate students provided the intervention and for this study were called interventionists. Four interventionists worked in collaborative pairs and conducted the treatment sessions. The interventionists completed an hour-long training session in which both video and live demonstration were used to teach explicit vocabulary intervention embedded in the storybook read aloud and receptive and expressive elicitation techniques. After the initial training session, the interventionists implemented the techniques in the language group program under the guidance of the researcher for a minimum of two hours. To gain mastery of the techniques, the interventionists conducted language group sessions with their assigned intervention groups using storybooks not used in the intervention phase.

Each intervention technique was then assessed by the researcher. Reading with expression was assessed using the Fluency Rubric (Rasinski, 2004; Appendix F) which rates a read aloud in four areas: expression and volume, phrasing, smoothness, and pace. During a storybook reading each interventionist attained a rating of five in all areas on the reading fluency rubric. Additionally, the researcher assessed each interventionist's use of the explicit vocabulary intervention and the elicitation techniques (see Vocabulary Intervention Assessment, Appendix E). When the interventionist demonstrated mastery of the intervention techniques, the intervention phase of the research commenced.

Data Sources and Analysis

In the current research study, researcher designed probes were employed to assess the participants' vocabulary knowledge for the target words. The C*omprehension Probe*

and the *Definition Probe* developed by the researcher following the design described by Blewitt and Langan (2016) assessed receptive vocabulary and semantic knowledge of the ten words targeted in the intervention. Vocabulary intervention embedded in the storybook read aloud was the independent variable. The dependent variables are the pre-test and posttest scores on the two vocabulary measures, and the target words spontaneously produced in the language sample.

The two researcher-designed semantic measures, the *Comprehension Probe* and the *Definition Probe,* examined receptive and semantic knowledge of the 10 intervention words and 10 non-intervention words. The raw scores from pre-intervention assessment were compared with the post-intervention scores. Additionally, the raw score on total words assessed was compared with the scores on the intervention words. The *Comprehension Probe* provided a possible raw score for total words of 20 and intervention words of 10. The *Definition Probe* provided a raw score that ranged from zero to an unlimited score. Each element of the definition was awarded a score of 1 and multiple elements may be included in the definition. Individual raw scores were averaged to attain a group mean of pre-intervention and post-intervention scores by group. Also, the mean of the scores for total words and intervention words were compared.

The one-way analysis of variance was used to determine if the difference between the factors, time and condition, is statistically significant. An ANOVA with two independent levels (pre- and post-intervention data) was calculated for each vocabulary probe assessing the impact of time. Additionally, an ANOVA with two dependent levels

(experimental and control groups) was calculated to assess the impact of the condition on vocabulary knowledge.

Due to the small sample size, effect size was used to determine the practical significance using the mean scores for pre-intervention and post-intervention vocabulary measures. Employing Cohen's *d*, a measure of effect size, allows for researchers to assess the magnitude of a given relationship when the sample size is small providing a measure of practical significance (Hill, Bloom, Black & Lipsey, 2008; Kraft, 2019). The standardized effect size statistic is the measure of the difference of the two means divided by the standard deviation and is expressed as:

$$\frac{[Mean_1 - Mean_2]}{Standard\ Deviation} = Effect\ size$$

The interpretation of the effect size as suggested by Cohen (1988) states that an effect size value of 0.20 demonstrates a "small" positive effect, 0.50 indicates a "medium positive effect, and 0.80 is considered a "large" positive effect.

Additionally, after the intervention phase was completed the language sample using a story retell was collected with each participant in the treatment group. Analysis of the language sample transcripts provided a measure of number of different words (NDW) which quantifies the vocabulary diversity for that sample. The NDW scores were compared with normative data presented by Templin (1957). Furthermore, descriptive measures were used to analyze the spontaneous word productions in the language sample data. The total number of target words and the number of different target words spontaneously produced in the sample was calculated. Additionally, the frequency of spontaneous production by word and by word type were calculated from the language sample data.

Measures of Fidelity and Reliability.

To determine whether the intervention procedures were accurately followed procedural fidelity was assessed during the intervention phase. A certified speech-language pathologist blind to the purpose of the study acted as the research assistant. The research assistant reviewed recordings of four of the intervention sessions and independently completed the Fluency Rubric (Rasinski, 2004; Appendix F) and the Vocabulary Intervention Assessment (Appendix E) based on the performance of the interventionists.

Reliability was assessed for the vocabulary measures performed in this study. Interrater reliability was assessed in order to determine how consistent different observers were in scoring the EOWPVT-4, ROWPVT-4, *Comprehension Probe*, and the *Definition Probe.* The research assistant rescored 10% of each assessment and percent agreement on the scores was calculated. Additionally, interrater reliability was evaluated for 10% of the language samples. The research assistant transcribed the language samples and independently calculated the NDW scores. Percent agreement on the NDW scores was calculated.

Chapter IV

RESULTS

The purpose of this study was to assess the effectiveness of explicit vocabulary intervention embedded in an interactive storybook reading (ISR) on word learning in preschool. The following research questions were posed in this study:

(1) Is explicitly teaching vocabulary during interactive storybook reading associated with changes in receptive vocabulary?

(2) Is explicitly teaching vocabulary during an interactive storybook reading associated with changes in semantic knowledge (word meaning knowledge)?

(3) Is explicitly teaching vocabulary during an interactive storybook reading associated with spontaneous use of taught vocabulary words?

The first two research questions were investigated by comparing the pre- and posttest vocabulary measures of the thirteen participants in the treatment group, who received the vocabulary intervention, with scores from the eleven participants in the control group. The third question was examined using spontaneous language sample data collected from participants in the treatment group a week after the intervention phase.

Receptive Vocabulary Scores

To examine the question whether the vocabulary intervention positively impacted the receptive vocabulary knowledge, *Comprehension Probe* scores were compared for the treatment and control group. The *Comprehension Probe* consisted of ten target words

and ten foils for a total of twenty words. In Figure 1, the mean scores for the total words and the target words are presented for both the control and the treatment groups.

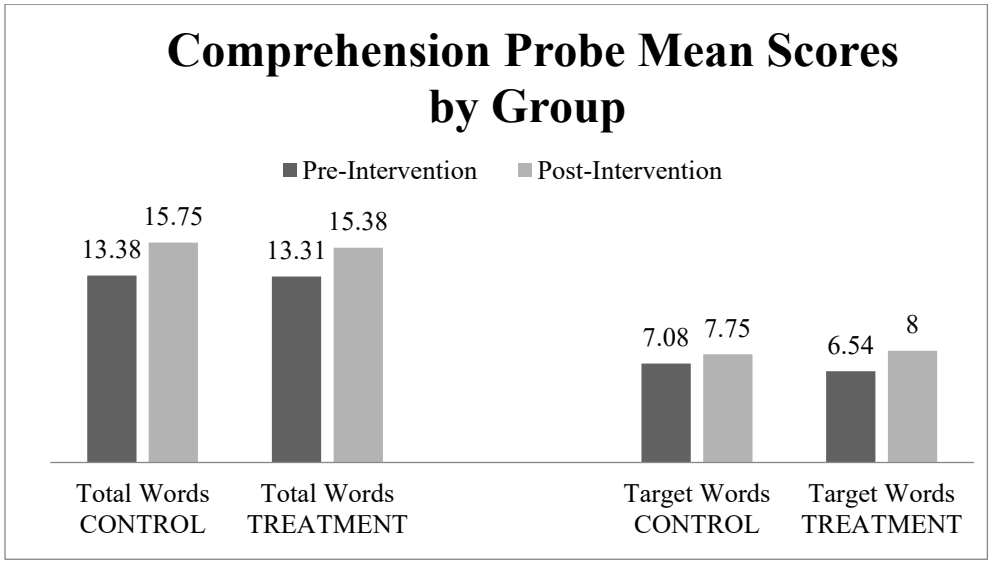

Figure 1. Comprehension Probe Mean Scores by Group

The pre-intervention scores on the *Comprehension Probe* ranged from 5 – 19 for the total words (20) and ranged from 3-10 for the target words (10) for all participants in both treatment and control groups. On the total *Comprehension Probe* both groups scores increased. The treatment group's mean scores increased from 13.31 to 15.38, while control group's scores increased from13.38 to a mean of 15.75. Similarly, the scores on the *Comprehension Probe* for the target words increased for both participant groups. The treatment group mean scores increased from 6.54 to a median of 8.0 for the words targeted in the intervention, while the control group's mean score was 7.08 and increased to 7.75.

In order to investigate if mean differences between the control and experimental groups' receptive vocabulary skills existed, a repeated measures ANOVA was administered on the *Comprehension Probe* data as a function of time (pre vs. post-

intervention) and group (control vs. experimental). A significant main effect of time was found, F (1,22) = 10.02, p = .004, η^2 = .31. This main effect indicated that both groups performed better on the post-intervention test (15.38) than on the pre-intervention vocabulary test (13.42) (see Figure 1). No other main effects or interactions were found to be significant. Similarly, when the *Comprehension Probe* data for the target words were analyzed, a significant main effect of time was found, F (1,22) = 13.21, p = .001, η^2 = .38, indicating that both groups scores increased on this measure from pretest to posttest.

Employing Cohen's *d*, a measure of effect size, allows for researchers to assess the magnitude of a given relationship when the sample size is small providing a measure of practical significance (Hill et al., 2008; Kraft, 2019). The standardized effect size statistic is the measure of the difference of the two means divided by the standard deviation and is expressed as:

$$\frac{[Mean_1 - Mean_2]}{Standard\ Deviation} = Effect\ size$$

The interpretation of the effect size as suggested by Cohen (1988) states that an effect size value of 0.20 demonstrates a "small" positive effect, 0.50 indicates a "medium positive effect, and 0.80 is considered a "large" positive effect.

For the total *Comprehension Probe* scores, the effect size for the control group is calculated as 0.53 and the treatment group's effect size score is 0.57. In this case both groups' effect size was considered "medium" and no significant difference was noted between the two groups on this measure. In contrast, the *Comprehension Probe* scores for the target words was calculated for the control group as 0.37, or a "small" effect size, while the treatment group's effect size was calculated as 0.81, indicating a "large" effect.

These results indicate that comprehension of the target words between the pretest and the posttest resulted in a larger effect size for the participants in the treatment group.

Semantic Knowledge Probe Scores

To examine whether the vocabulary intervention impacted semantic knowledge for the target words, *Definition Probe* scores were compared for the treatment and control group. The *Definition Probe* consisted of ten target words and ten foils for a total of twenty words. For this measure scores increased when more features of the definition were stated and no maximum score was defined. In Figure 2, the mean scores for both the total words and the target words are presented for both the control and the treatment groups.

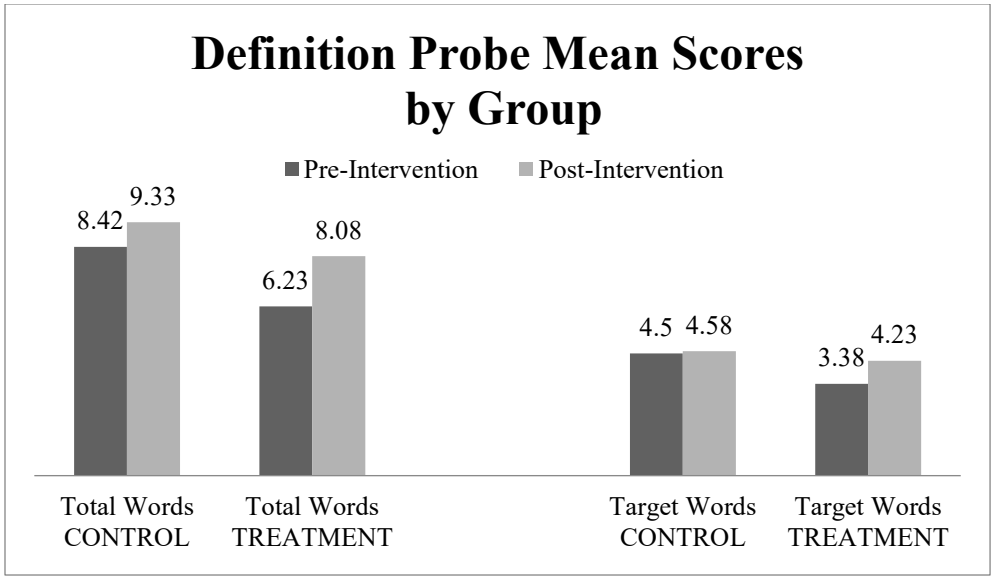

Figure 2. Definition Probe Mean Scores by Group

The pre-test score on the *Definition Probe* ranged from 0-22 for the total words (20) and ranged from 0-11 for the intervention words (10) for all participants in both treatment and control groups. On the total *Definition Probe* both participant groups increased their mean scores. The treatment group scores increased from a mean of 6.23

to 8.08, while the control group's scores increased from mean of 8.42 to 9.33. Similarly, the scores on the *Definition Probe* for the ten target words increased for both groups. The treatment group scores increased from a mean of 3.38 to a mean of 4.23 for the words targeted in the intervention, while the control group's mean score was 4.5 and increased to 4.58.

In order to investigate if mean differences between the two groups on the *Definition Test* exist, a repeated measures ANOVA was administered on the *Definition Total words* data as a function of time (pre vs. post-intervention) and group (control vs. experimental). A significant main effect of time was found, F (1,22) = 6.612, p = .017, η^2 = .23. This main effect indicated that both groups performed better on the post-intervention vocabulary probe (8.37) than on the pre-intervention vocabulary probe (6.08). No other main effects or interactions were found to be significant. Similarly, analysis of the *Definition Probe* for the target word data found no significant main effects or interaction.

Effect size was measured for the *Definition Probe* by finding the difference between the mean of the pretest and posttest for the total words and dividing by the pooled standard deviation of both testing times. The *Definition Probe Total* words effect size for the control group was calculated as 0.11, while the effect size for the treatment group was calculated as 0.41 showing a small and positive effect. The effect size for the *Definition Probe* scores for the target words for the control group was 0.02, or insignificant, whereas the treatment group's effect size was 0.34, showing a small and positive effect size.

Language Sample Data

Spontaneous language sample data was collected for each participant in the treatment group. One week after the intervention phase was completed a language sample was collected with each participant retelling the storybooks. Each language sample was transcribed and entered into the SALT program for analysis. NDW was used to measure the vocabulary diversity of the spontaneous story retell samples. In Figure 3, NDW scores for the 13 participants in the treatment group are presented by age.

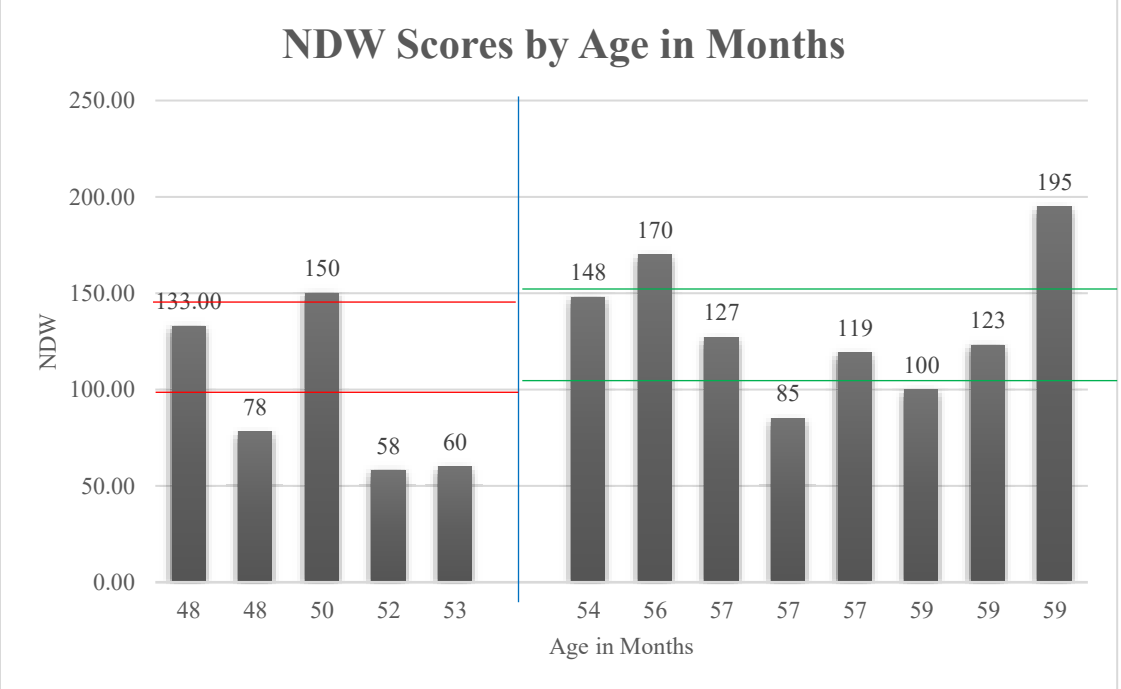

Figure 3. NDW Score by Age in Months for Treatment Group

These NDW scores were compared to Templin's (1957) normative scores for NDW of 120.4 (SD 27.6) for 4-year old children and 127.0 (SD 23.9) for children 4.5 years old. Applying these normative data provides a range for the NDW expected for children 48-53 months old of 99.8-147 words, while the expected NDW score for children 54-59 months old is 104-150.9. Five of the participants in the treatment group were younger than 53 months. Three of these participants obtained NDW scores well

below the minimum score of 99.8 expected for their age, while two participants from this age group had NDW scores within or above the normal range on this measure. Of the eight participants in the older age group, two participants obtained NDW scores below the minimum score for 104 expected for their age. Six participants had NDW scores that were at or above the normal range. These results indicate that five participants in the treatment group demonstrated limited vocabulary diversity when compared to the normative sample, while eight participants showed vocabulary diversity during the story retell task that was within normal limits for their age.

Additionally, the treatment group participants spontaneously produced target words during the retell of the story demonstrating the ability to produce the target words without prompt and in the context of connected speech. In Figure 4, the number of total target words and the number of different target words produced in the language sample is presented.

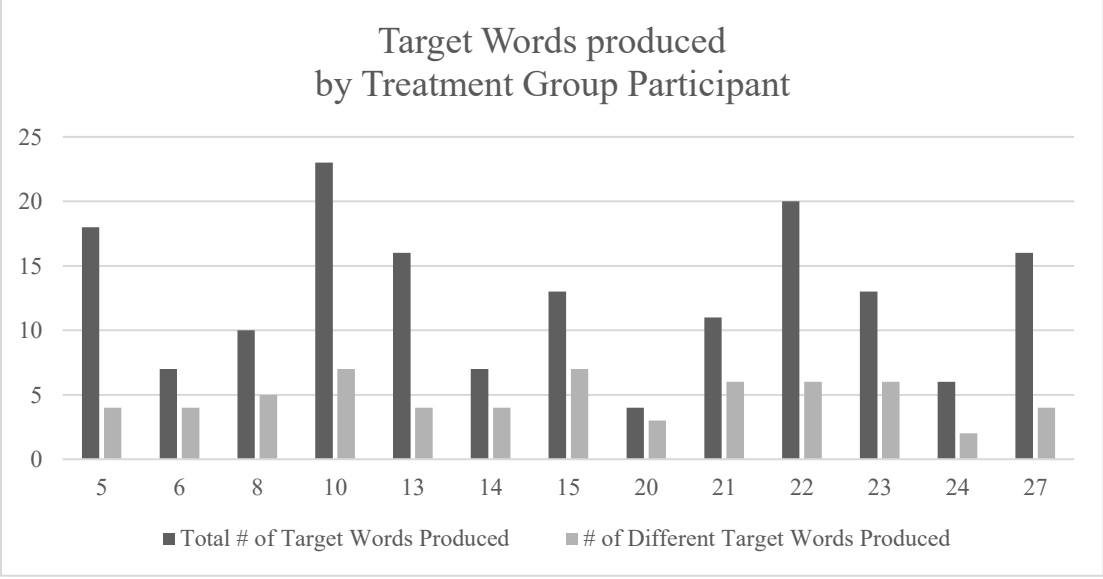

Figure 4. Target Words Produced by Treatment Group Participant

All of the participants in the treatment group produced target words spontaneously in the language sample. The total number of target words produced by a participant ranged from 4-23. Since some words were produced more than once, the number of different target words ranged from 2-7. On average, participants produced 12.6 target words in the language samples. Participants produced an average of 4.8 different target words in the language samples.

Additional analyses revealed that all of the target words were produced in the language samples. The frequency of production of target words varied by the word. In figure 5, the number of total productions for each word is presented. Each participants' production data is presented and represented by a different color.

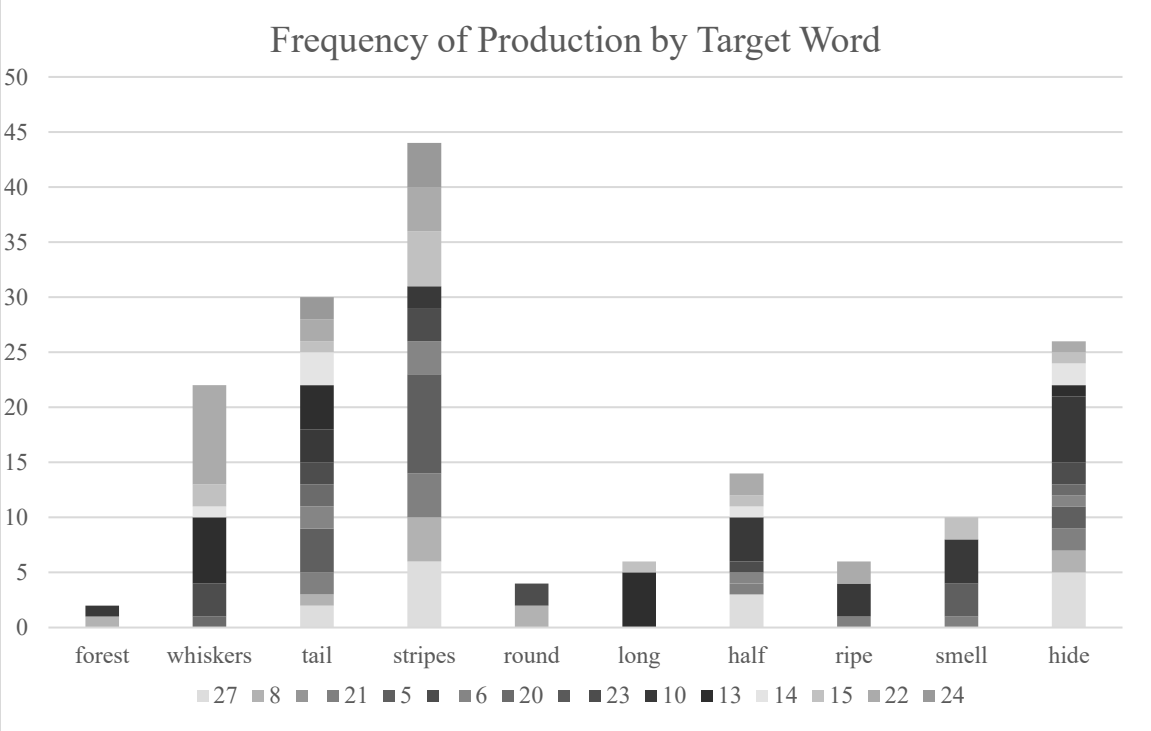

Figure 5. Frequency of Production by Target Word

Target words were spontaneously produced 164 times in the language samples. The frequency of productions for each target word ranged from 2-44. Each of the target

words was produced at least twice by a minimum of two different participants. The target word, forest, was produced once by two participants, whereas the target word, stripes, was produced more than twice by a total of 10 participants. Repeated productions of target words increased the frequency count for a target word. Multiple productions of a word account for 43 of the instances of target words in the samples, while 19 of the instances are single productions of a target word.

Further analysis examined the frequency of the word by the part of speech. The four target words, whiskers (22), forest (2), tail (30), and stripes (44) functioned as nouns in the storybook. These nouns targeted in the intervention were spontaneously produced in the language samples 98 times. Additionally, nouns accounted for 59.7% of the total target words produced in the language samples. Four of the target words were adjectives, round (4), long (6), half (14), and ripe (6). These words described items in the storybooks. These adjectives were produced a total of 30 times, which made up 18.2% of the total target word productions. Of the target words two functioned as verbs in the storybooks, smell (10) and hide (26). These verbs were produced a total of 36 times in the samples and made up 21.9% of the target words produced in the language samples.

Intervention Data

For each of the two storybooks there were three intervention sessions: two ISR sessions and a story retell session. During the first and second sessions, ISR techniques were used to teach the five intervention vocabulary words per book. During the first two intervention sessions for each book, each target word was presented an average of 11 times to the participants, while the child-friendly meaning was presented an average of 7 times. In the first session, the storybook was read using the ISR and receptive responses

from the participants were elicited. During this initial session of each storybook intervention, the participants demonstrated receptive knowledge of each target word an average of 1.4 times. In the second session, the participants expressively produced each target word an average of 1.6 times.

The final session for each storybook consisted of a group story-retell activity. During these story-retell sessions, the participants were provided open-ended prompts to elicit the retell of the story as the interventionist turned the pages of the book. Beginning with the cover of the book, the interventionist asked the participants about the topic of the story book. Then the interventionist provided open-ended prompts for the characters, setting, initiating event, continuing sequence, an internal response, cause and effect and resolution to the story. The researcher observed the story retell sessions and recorded whether the participants' utterances were in response to prompts or spontaneous. The majority of the utterances produced during the group retell session were in direct response to the open-ended prompts (71 - 89%) while the remainder of the utterances were spontaneous.

Fidelity and Reliability

During the first and second intervention sessions with each book when ISR intervention techniques were used, procedural fidelity was assessed using two measures: the Fluency Rubric (Appendix F) and Vocabulary Intervention Assessment (Appendix E). The Fluency Rubric, a rating scale for reading fluency, was used to assess whether the story was read with expression. Vocabulary Intervention Assessment, a checklist of the receptive and expressive vocabulary intervention techniques, was used to determine whether the techniques were used during the intervention. Recordings of four of the

intervention sessions were reviewed by a second speech-language pathologist, who completed the Fluency Rubric and Vocabulary Intervention Assessment. Results showed that each interventionist demonstrated the use of all the vocabulary intervention techniques and scored a "4" in all areas of the Fluency Rubric. Overall, procedural fidelity was judged to be excellent.

To check interrater reliability, 10% of each type of assessment; EOWPVT-4, ROWPVT-4, *Comprehension Probe*, and *Definition Probe,* were rescored by a second speech-language pathologist blind to the participants' condition. For the EOWPVT-4, ROWPVT-4 and the *Comprehension Probe* 100% inter-rater agreement was found. The same procedure was followed for the *Definition Probe.* On this measure the inter-rater reliability was calculated at 94% agreement. Finally, 10% of the language samples were assessed for interrater reliability. A second speech-language pathologist transcribed three language samples. The analysis in SALT was performed and NDW calculated for each of the samples. For NDW, percent agreement was calculated at 98% indicating excellent inter-rater reliability on this measure.

Chapter V

DISCUSSION

The purpose of this study was to examine the effect of explicitly teaching tier two vocabulary words during an interactive storybook reading on the semantic knowledge, expressive and receptive vocabulary skills of preschool students from low SES households, who are considered at risk for low vocabulary skills. Semantic knowledge for the target words was examined using pretest and posttest scores on the *Definition Probe*. Receptive vocabulary skills were assessed using the pre- and posttest measure of the *Comprehension Probe.* Finally, expressive vocabulary skills were examined using the spontaneous word productions of the participants in the treatment group during a language sample.

Receptive Vocabulary

The first goal of the study was to determine whether receptive vocabulary skills were impacted by the vocabulary intervention. The statistical analyses found that both the treatment and the control groups increased scores on the receptive vocabulary measure over the course of the study. These results indicate that the participants who were not provided the vocabulary intervention gained receptive vocabulary skills. Additionally, both groups showed an increase on this vocabulary measure for both the intervention words and the non-intervention vocabulary words over the period of the study.

Comprehension of the words was measured using a four-color picture display where the examinee pointed to indicate the picture that matched the word. This vocabulary measure presented the examinee a closed set of responses and required the simple response of pointing to the correct item. Naturally, scores on a closed set tend to be higher than the scores on an open-ended expressive assessment tool. Although the order of the items was varied from pretest to posttest, the pictures presented remained the same. It is possible that some increase in the scores on this assessment may be due to familiarity with the testing situation and the items being presented again at the posttest.

Given that vocabulary growth is considered to be incremental (Beck et al., 1987), with each encounter one learns more about the new word, the earlier stages of learning a word are considered foundational to developing a deeper knowledge of a given word. Since the *Comprehension Probe* followed the design used by Blewitt and Langan (2016), along with the target picture, a picture of a related item from the same subordinate category, was presented for each word. This similar item is considered a semantic foil for this receptive probe. By not selecting the similar yet incorrect picture, the examinee shows a level of vocabulary knowledge that is beyond that of the fast-mapped word, which is indicative of limited encounters with the novel word. Furthermore, correct responses on this task indicate the respondent has, at a minimum, receptive knowledge of the vocabulary word in a limited context, which is necessary for further word learning.

Numerous studies examining vocabulary interventions employ effect size, a measure of practical significance for small data sets, to assess posttest differences (Coyne, McCoach & Kapp, 2007; Justice et al., 2005; Neuman & Dwyer, 2011; Zucker, Solari, Landry & Swank, 2013). In the current study, Cohen's *d* was calculated to

estimate the effect size of the intervention on the *Comprehension Probe* scores. On all of the words (non-intervention and intervention words) a medium, positive effect size was calculated for both the treatment (0.57) and the control (0.53) groups. These results indicate that both groups gained vocabulary words over the course of the study. Additionally, the effect size for the vocabulary words targeted in the intervention was found to be small and positive (0.37) for the control group. However, the treatment group showed a large and positive (0.81) effect size for the target words. These findings are consistent with Zucker et al. (2013), who found a large, positive effect size on the posttest measure of vocabulary comprehension with preschool-aged children.

In summary, the participants in the current study showed increases in receptive vocabulary skills over the course of the study. Furthermore, the treatment group showed a large and positive increase in receptive vocabulary word knowledge when compared to the control group, providing an evidence basis for explicit vocabulary intervention as a practice for preschool-aged children (Al Otaiba, Rouse & Baker, 2018).

Semantic Knowledge

The second goal of this study was to examine whether semantic knowledge, a measure of depth of word knowledge, was impacted by the intervention. Semantic knowledge was assessed through the *Definition Probe*, which elicited a definition or word meaning for ten target words and 10 non-intervention words. It was found that both groups showed increased scores on the semantic measure for the total words. No significant difference was noted for the words targeted in intervention. For the *Definition Probe* the effect size calculations showed that for the control group there was no effect for both the total words (0.11) and the target words (0.02). Whereas the treatment group

showed a small, positive effect size for both the total words (0.41) and on the words targeted in the intervention (0.34). These results indicate that the intervention may have had a small effect on the participants' semantic knowledge of the target words.

In contrast, Justice et al. (2005) implemented explicit vocabulary intervention with Kindergarten students and found a large effect size (1.22) in semantic knowledge for words taught explicitly. The findings in this study may differ from the current study in part because the participants were older and differences in how the intervention was implemented. Due to the age and maturity of the participants in the study, the explicit vocabulary intervention provided a definition during the read aloud. In contrast, the current study provided child-friendly meanings during the story read aloud. While this level of word meaning is consistent with interactive storybook reading techniques used in preschool classrooms (van Druten-Frietman, Strating,& Dennessen, 2016; Wasik & Bond, 2001; Zucker et al. 2013), participants in the current study were not exposed to definitions of the target words during the intervention phase. Furthermore, Beck, McKeown and Kucan (2002) described the definition as decontextualized word knowledge and the production of a definition as an advanced level of vocabulary skill. Accordingly, children in preschool are rarely asked to produce definitions and have little dictionary experience.

In summary, limited gains were noted in the semantic knowledge for the treatment group. The small and positive effect size on this measure is noteworthy because not only was the skill of producing a definition not targeted in the intervention, but this is not a skill expected of preschool-aged students in general.

Expressive Vocabulary

The explicit vocabulary intervention provided opportunities for participants to produce the new vocabulary words within the context of the story. Additionally, the final session with the story book afforded the participants an opportunity to tell the story within the small group setting. Finally, as a measure of the expressive use of the vocabulary words, language samples were collected of the participants in the treatment group retelling the stories. To address the third goal of this study, these language sample data were analyzed, which revealed that all of the target words were produced by at least two participants in the treatment group. Although intervention words were often repeated within the sample, an average of 4.8 different target words were spontaneously produced during the retelling of the stories. These findings indicate that participants produced almost half the target words spontaneously during the retelling of the story.

The findings of the current study are consistent with Penno et al. (2002) who found that repeated exposures to target words and their meanings increased spontaneous word production during the retell task. According to the authors, using the words during a retell is considered generalized word use. Consequently, the results of the current study indicate that the treatment group showed generalized use of almost half of the words targeted in the intervention.

Vocabulary Production by Word Class.

Three classes of words (noun, verb and adjective) that are familiar to preschool students, were targeted in this study. Four nouns were targeted in the intervention and in the language sample data nouns made up nearly 60% of the target words produced spontaneously. The prevalence of noun productions is anticipated since nouns

representing objects were clearly pictured in the storybooks and children of this age are familiar with the task of labeling items that are pictured. Although four adjectives were targeted in the intervention, this word type made up only 18% of the words produced spontaneously during the story retell sample. A possible reason for the limited use of adjectives in the retells may be that adjectives inherently describe nouns, therefore the learnability of the adjective is dependent on the level of familiarity of the relevant noun to the learner. Additionally, adjectives are descriptive words that provide details, while the other word types targeted are essential to the formation of sentences. Therefore, adjectives may be less common in the spontaneous language samples because they are less necessary to the utterance. Although only two verbs were targeted in the intervention, verbs were the second most frequently produced word type at 22%. These findings are consistent with the belief that verbs are the most learnable of the three types of words (Justice et al., 2005). Additionally, verbs are essential to the formation of simple sentences, which make them important elements in most of the spontaneous utterances in the language samples.

In summary, as expected nouns and verbs made up the majority of the spontaneously produced target words in the retell because they are essential elements of the sentences. Since adjectives provide further details about the noun, adjective learning is limited by the familiarity of its noun. Therefore, the findings of this analysis of spontaneously produced words by word type are consistent with the necessary frequency of nouns and verbs in simple sentences of the language samples.

Implications

The purpose of this study was to determine whether explicit vocabulary intervention positively impacts word learning for low SES preschool children. It is noteworthy that while all of the participants in both the treatment and control groups gained new words during the study. One measure of evidence basis for a treatment is the minimum effect size of 0.25 (Al Otaiba et al., 2018). Therefore, is notable that for the participants in the treatment group a large and positive effect (0.81) was found in receptive vocabulary. Due to the incremental nature of word learning, gaining receptive skills for new words is an essential first step toward vocabulary growth, therefore each word gained receptively is viewed as in the initial stage of that word becoming a fully integrated part of the child's lexicon. Additionally, the participants in the treatment group showed a small, positive effect (0.34) in semantic knowledge. These results show a measurable effect of explicit vocabulary intervention on preschool-age attending the Head Start program. Furthermore, every participant in the treatment group showed expressive use of some of the target words and on average the participants showed generalized use of nearly half of the target words. Additionally, results from the spontaneous language sample data showed that this intervention provided participants the opportunity to use newly acquired words in a familiar yet meaningful context while demonstrating expressive vocabulary skills. This study showed that explicit vocabulary intervention provided a systematic means to teach vocabulary words to preschool-aged children at risk for language deficits. These findings add to the evidence supporting the efficacy of explicit vocabulary intervention for the preschool-aged student who comes from a low-income household.

Limitations

There are several limitations of the current study. The study used two researcher-designed vocabulary assessment tools and inherent in researcher-designed tools is a certain level of ambiguity. Of the two researcher-designed measures, the C*omprehension Probe* most closely matched the standard manner of assessing receptive vocabulary and responses were recorded as correct or incorrect. On the other hand, the *Definition Probe,* assessed a level of sematic knowledge that is not commonly measured by standard vocabulary assessment tools. While researcher-designed measures are found to be more sensitive to vocabulary growth (Coyne, et al., 2007), the researcher-designed measurement of semantic knowledge of the target words may have contributed to ambiguous results. In this study, the *Definition Probe* awarded points for each semantic element of the definition produced allowing for an infinite score, whereas other tools that probe for the production of a definition of a target word use a scale to award a single point for a partial definition and two points for a complete definition (Coyne et al., 2007; Justice et al., 2005; Storkel et al., 2019). Using the rating scale for the definition may provide a better measure of semantic knowledge especially for the younger child with limited experience with producing definitions.

This study collected the story retell of the intervention storybooks for the spontaneous language sample. A premise of this study was that the participants were exposed to the storybook only through the intervention. Since the treatment group had been exposed to the stories, spontaneous story retell samples were only collected from the participants in the treatment group. While retell samples from the control group may

have differed from the treatment group samples, the lack of the sample data for comparison is a major limitation of this study.

In this study, the intervention phase was limited to six sessions over a three-week period. The progression of word learning requires upwards of 15 exposures of the target word (Beck et al., 1987), whereas children with language disorders require as many as 36 exposures to learn a new word (Storkel et al, 2019). The short duration of the study, limited the number of exposures may have impeded the learning of new words. Providing explicit vocabulary intervention for a longer period of time could allow the students an adequate number of exposures to new words.

The criterion for inclusion in the study allowed for participants with typical vocabulary skills to take part. Since the intervention was targeted toward children with language delays, selecting participants with vocabulary deficits may have impacted results of this study. Additionally, sample size was small, which reduced the strength of the statistical analyses. Conducting the investigation at a number of research sites and thereby increasing the sample size could improve the strength of the analyses.

Finally, this study examined the direct impact of the intervention via immediate post testing. Assessing vocabulary knowledge two weeks and two months post intervention could provide a measure of the long-term impact of explicit vocabulary intervention.

Chapter VI

CONCLUSION

The results of this study indicate that all participants showed gains in vocabulary over the time of the intervention. While no significant difference was noted between the control group and the treatment group, effect size data showed a large and positive effect on the comprehension of the target words for the treatment group. These results indicate that explicit vocabulary intervention during a storybook read aloud can positively impact receptive vocabulary knowledge, an essential first step in vocabulary growth. In contrast, semantic knowledge of the target words showed no significant difference and only a small effect size between the treatment and control groups. Due to the unfamiliar nature of the definition task for a preschool student, small gains in semantic knowledge of new words are considered a positive finding. Finally, the language sample data showed that after the intervention participants spontaneously produced all of target vocabulary words demonstrating expressive use of all the word types targeted. Additionally, these findings showed an average of 4.8 target words were generalized to spontaneous, expressive use in connected speech with the intervention participants.

In conclusion, despite the short time of the intervention and the small number of words targeted, gains were noted in receptive vocabulary skills for the target words, small gains were noted in semantic knowledge, and all of the target words were produced spontaneously during the retell task. These results indicate that the vocabulary knowledge was greater after the intervention phase for these preschool students attending

Head Start. Finally, this study found that explicit vocabulary intervention embedded in a storybook read aloud can positively enhance vocabulary learning for preschool children at-risk for language deficits.

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Appendix A:

Institutional Review Board Expedited Protocol Approval

Institutional Review Board (IRB)
for the Protection of Human Research Participants

EXPEDITED PROTOCOL APPROVAL

Protocol Number: IRB-03773-2019 **Responsible Researcher:** Karen R. Noll

Project Title: *Closing the Vocabulary Gap in Preschool: Explicit Vocabulary Intervention embedded in Interactive Storybook Reading*

Level of Risk:	☒ Minimal	☐ More than Minimal
Type of Review:	☒ Expedited	☐ Convened (Full Board)
Approval Categories:	**6 & 7**	
Approval Date:	**06.19.2019**	
Expiration Date:	**06.19.2022**	

Consent Requirements:

- ☐ Adult Participants – Written informed consent with documentation (signature)
- ☐ Adult Participants – Written informed consent with waiver of documentation (signature)
- ☐ Adult Participants – Verbal informed consent
- ☐ Adult Participants – Waiver of informed consent
- ☒ Minor Participants – Written parent/guardian permission with documentation (signature)
- ☐ Minor Participants – Written parent/guardian permission with waiver of documentation (signature)
- ☐ Minor Participants – Verbal parent/guardian permission
- ☐ Minor Participants – Waiver of parent/guardian permission
- ☐ Minor Participants – Written assent with documentation (signature)
- ☒ Minor Participants – Written assent with waiver of documentation (signature)
- ☐ Minor Participants – Verbal assent
- ☐ Minor Participants – Waiver of assent
- ☐ Waiver of some elements of consent/permission/assent

Approval: This research protocol is **approved as presented**. Your approved consent form(s), with IRB approval stamp are attached. If you prefer the original stamped consent, please email tmwright@valdosta.edu and the form will be sent via inter-office mail, or you may come by the OSPRA office to obtain the original. Please see page 2 for additional important information for researchers.

Comments:

Elizabeth Ann Olphie *06.19.2019*

Elizabeth Ann Olphie, IRB Administrator Date

Thank you for submitting an IRB application.
Please direct questions to irb@valdosta.edu or 229-253-2947.

Form Revised: 06.02.16

EXPEDITED PROTOCOL APPROVAL REPORT
Attachment 1

ADDITIONAL INFORMATION FOR RESEARCHERS:

If your protocol received expedited approval, it was reviewed by a two-member team, or, in extraordinary circumstances, the Chair or the Vice-Chair of the IRB. Although the expediters may approve protocols, they are required by federal regulation to report expedited approvals at the next IRB meeting. At that time, other IRB members may express any concerns and may occasionally request minor modifications to the protocol. In rare instances, the IRB may request that research activities involving participants be halted until such modifications are implemented. Should this situation arise, you will receive an explanatory communiqué from the IRB.

Protocol approvals are generally valid for three years. In rare instances, when a protocol is determined to place participants at more than minimal risk, the IRB may shorten the approval period so that protocols are reviewed more frequently, allowing the IRB to reassess the potential risks and benefits to participants. The expiration date of your protocol approval is noted on the approval form. You will be contacted no less than one month before this expiration date and will be asked to either submit a final report if the research is concluded or to apply for a continuation of approval. It is your responsibility to submit a continuation request in sufficient time for IRB review before the expiration date. If you do not secure a protocol approval extension prior to the expiration date, you must stop all activities involving participants (including interaction, intervention, data collection, and data analysis) until approval is reinstated.

Please be reminded that you are required to seek approval of the IRB before amending or altering the scope of the project or the research protocol or implementing changes in the approved consent process/forms. You are also required to report to the IRB, through the Office of Sponsored Programs & Research Administration, any unanticipated problems or adverse events that become apparent during the course or as a result of the research and the actions you have taken.

Please refer to the IRB website (http://www.valdosta.edu/ospra/HumanResearchParticipants.shtml) for additional information about Valdosta State University's human protection program and your responsibilities as a researcher.

Appendix B:

Permission for Participation in Research

VALDOSTA STATE UNIVERSITY

Parent/Guardian Permission for Child's/Ward's Participation in Research

You are being asked to allow your child (or ward) to participate in a research study entitled "***Closing the Vocabulary Gap in Preschool: Explicit Vocabulary Intervention embedded in Interactive Storybook Reading.***" This research study is being conducted by Karen Noll, a faculty member in the Communication Sciences and Disorders Department at Valdosta State University. The purpose of this research is to examine the effectiveness of the Language Group intervention. Your child's participation in this study is entirely voluntary. From this point on in this form, the term "child" is used for either a child or a ward.

As described in more detail below, we will ask your child to participate in a small group language intervention including a story book read aloud with vocabulary activities. Your child's participation will include treatment sessions of 30-minutes twice a week for a semester as well as hearing and language assessments. Someone in your position might be interested in allowing your child to participate in this preschool language enrichment program designed to increase vocabulary and pre-literacy skills needed for school success. Because there are some risks, such as time away from the classroom, you may not wish to allow your child to participate. It is important for you to know that you or your child may discontinue participation at any time during this study.

This form includes detailed information to help you decide whether to participate in this Language Group intervention. Please read it carefully and ask any questions that you have before you agree to participate. Please be sure to retain a copy of this form for your records.

Procedures:

The Head Start Language Group is a language enrichment program provided at the Lowndes 1 Head Start in cooperation with VSU's Department of Communication Sciences and Disorders. Under the supervision of a licensed speech-language-pathologist, graduate student clinicians plan and implement language intervention for small groups of Head Start students. These groups meet twice a week for 30-minute sessions focusing on increasing pre-literacy skills and vocabulary development; language skills necessary for school success. Treatment groups focus on language and vocabulary development such as basic concepts (between, hot and cold, same and different...), wh-questions (who, what, where), and sentence formulation (subject + verb). Language skills needed for reading success are also addressed such as concepts of print, phonological awareness, and early narrative skills. In addition, participating children complete a hearing screening and a brief speech and language assessment. You or your child may discontinue participation at any time during this study regardless of the reason. All direct interaction with your child will occur at Lowndes 1 Head Start in the classroom and the cafeteria. This study involves research. There are no alternatives to the experimental procedures in this study. The only alternative is for you to choose not to allow your child to participate.

Possible Risks or Discomfort:

This is a minimal risk research study. That means that the risks of participating are no more likely or serious than those you encounter in everyday activities. Although there are no known risks to your child associated with the research procedures, it is not always possible to identify all potential risks of participating in a research study. However, the University has taken reasonable safeguards to minimize potential but unknown risks. Possible risks or discomforts include missing activities in class and being asked to respond to questions and prompts during the intervention. The level of risk is minimal considering the probability and magnitude of harm. By agreeing to participate in this research

project, you are not waiving any rights that you or your child may have against Valdosta State University for injury resulting from negligence of the University or its researchers.

Potential Benefits:
Participation in this research has potential benefits of enriching your child's language skills and increasing your child's pre-literacy skills necessary for school success. In addition, your child' participation may benefit the field of speech-language pathology and language intervention.

Costs and Compensation:
There are no costs to you and there is no compensation (no money, gifts, or services) for your participation in this research project.

Assurance of Confidentiality:
Valdosta State University and the researcher will keep your child's information confidential to the extent allowed by law. Members of the Institutional Review Board (IRB), a university committee charged with reviewing research to ensure the rights and welfare of research participants, may be given access to your child's confidential information.

Your child will be assigned a code number as a way to identify and keep track of data. Numbers assigned to your child with not be associated with his/her name or any other identifying information. This is to ensure that individuals remain unidentifiable. Your child's birth date will be recorded as a way to calculate your child's chronological age in order to interpret scores and results of this study. All information obtained from testing will be kept in the researcher's office secured by lock and key. Only those individuals that YOU choose to share the results with will have access to the results.

Data from this study will be reported in combination with testing information obtained from other participants. None of the participants will be identified in this study by name or birth date.

Voluntary Participation:
Your decision to allow your child to participate in this research project is entirely voluntary. If you agree now to allow your child to participate and you change your mind later, you are free to withdraw your child from the study at that time. By not allowing your child to participate in this study or by withdrawing him/her from the study before the research is complete, you are not giving up any rights that you or your child have or any services to which you or your child are otherwise entitled to from Valdosta State University. If you decide to withdraw your child from the study after data collection is complete, your child's information will be deleted from the database and will not be included in research results.

Information Contacts:
Questions regarding the purpose or procedures of the research should be directed to Karen Noll at knoll@valdosta.edu. This study has been approved by the Valdosta State University Institutional Review Board (IRB) for the Protection of Human Research Participants. The IRB, a university committee established by Federal law, is responsible for protecting the rights and welfare of research participants. If you have concerns or questions about your rights as a research participant, you may contact the IRB Administrator at 229-253-2947 or irb@valdosta.edu.

Agreement to Participate:
The research project and my child's (or ward's) role in it have been explained to me, and my questions have been answered to my satisfaction. I grant permission for my child to participate in this study. By signing this form, I am indicating that I am either the custodial parent or legal guardian of the child. I have received a copy of this permission form.

I would like to receive a copy of the results of this study: _____ Yes _____ No

Mailing Address: _____

E-mail Address: _____

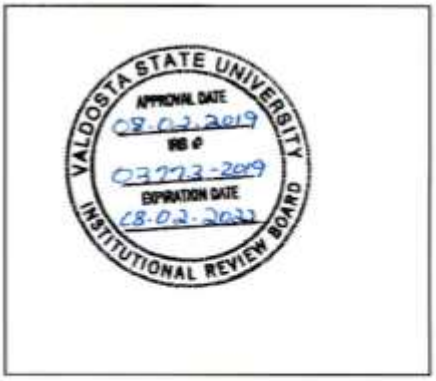
_____
Printed Name of Child/Ward

_____
Printed Name of Parent/Guardian

_____
Signature of Parent/Guardian Date

_____
Signature of Person Obtaining Consent Date

This research project has been approved by the Valdosta State University Institutional Review Board for the Protection of Human Research Participants through the date noted below:



Appendix C:

Comprehension Probe

Trial item

Show me **crown.**

Show me **smell.**

Show me **huge**.

Show me **friend.**

Show me **round**.

Show me **ripe.**

Show me **dream.**

Show me **whiskers.**

Show me **city.**

Show me **stripes.**

Show me **claw.**

Show me **alone.**

Show me **tail.**

Show me **hide.**

Show me **wave.**

Show me **forest.**

Show me **treasure.**

Show me **roll.**

Show me **half.**

Show me **long**.

Show me **collect**.

Appendix D:

Definition Probe Form

DEFINITION TEST RESPONSE SHEET

Participant Number: _____Date:_____

Class: _____Pretest/ Posttest

Each word is presented verbally and the student is asked to tell everything they know about the word. You will prompt the child to tell more about the word. Continue to prompt until the student can add no more information. Each response will be recorded and scored after the testing session. Be sure to record all responses that are related to the target word.

Introduce the stuffed animal, **Sam**. Say

"Sam does not know many words and needs some help. He needs you to tell him everything you know about these new words. Let's try this one."

Trial 1: **"Can you tell Sam what a sofa is?"** _____

_____

Prompt for Trial 1: **"What else can you tell Sam about a sofa?"** _____

_____

Continue with item 1-5 using these cues.

Question: **"Can you tell Sam what a [target] is?"**

Follow-up prompt: **"What else can you tell Sam about [target]?**

		Record Responses
1	**Roll**	
	(follow-up prompt)	
2	**Tail**	
	(follow-up prompts)	
3	**Dream**	
	(provide prompts)	
4	**Smell**	
	(provide prompts)	
5	**Treasure**	
	(follow-up prompts)	

DEFINITION TEST RESPONSE SHEET

Trial 2: **"Can you tell Sam what a train is?"** _____

_____

Prompt for Trial 2: **"What else can you tell Sam about a train?"** (Encourage full response on trial) _____

Continue with item 6-20 using these cues.

Question: **"Can you tell Sam what a [target] is?"**

Follow-up prompt: **"What else can you tell Sam about [target]?**

		Record all Responses
6	**Ripe**	
	(follow-up prompt)	
7	**Claw**	
	(follow-up prompts)	
8	**Stripes**	
	(provide prompts)	
9	**Collect**	
	(provide prompts)	
10	**Hide**	
	(follow-up prompts)	
11	**Friend**	
	(provide prompts)	
12	**Whiskers**	
	(provide prompts)	
	Encouraging words:	**"You're really good at this".** **"You know a lot of words, don't you?"** **"Sam is so happy that you are helping him."**

DEFINITION TEST RESPONSE SHEET

	"Sam thinks you are *really* smart." Question: **"Can you tell Sam what a [target] is?"** Follow-up prompt: **"What else can you tell Sam about [target]?**	
		Record all Responses
13	**City**	
	(provide prompts)	
14	**Forest**	
	(follow-up prompts)	
15	**Round**	
	(provide prompts)	
16	**Wave**	
	(provide prompts)	
17	**Half**	
	(provide prompts)	
18	**Alone**	
	(provide prompts)	
19	**Long**	
	(provide prompts)	
20	**Huge**	
	(follow-up prompts)	

Encouraging words: **"You're are so kind for helping Sam learn these words".**

"You are so good at this."

"Sam wants to thank you for helping him."

Appendix E:

Vocabulary Intervention Assessment

Vocabulary Intervention Assessment

Receptive vocabulary techniques: Intervention words were presented during story reading. Child-friendly definition for each intervention word was provided. Comprehension response prompted through Gesture, Pointing or answering a Wh-Q (Q).

Intervention Words	Word presented	Meaning presented	Gesture	Point	Wh-Q

Expressive vocabulary elicitation Techniques: Intervention words presented during story read aloud. Child-friendly word meaning provided for each intervention word. Dialogic reading prompts provided to elicit each intervention word:

COMPLETION prompt: fill-in the blank
WH QS: who, where, what, when, why, how
DISTANCING: relate story to child's life

Intervention Words	Word presented	Meaning presented	Completion	Wh-Q	Distance

Appendix F:

Fluency Rubric

NAME _____

FLUENCY RUBRIC

	1	2	3	4
Expression and Volume	Reads in a quiet voice as if to get words out. The reading does not sound natural like talking to a friend.	Reads in a quiet voice. The reading sounds natural in part of the text, but the reader does not always sound like they are talking to a friend.	Reads with volume and expression. However, sometimes the reader slips into expressionless reading and does not sound like they are talking to a friend.	Reads with varied volume and expression. The reader sounds like they are talking to a friend with their voice matching the interpretation of the passage.
Phrasing	Reads word-by-word in a monotone voice.	Reads in two or three word phrases, not adhering to punctuation, stress and intonation.	Reads with a mixture of run-ons, mid sentence pauses for breath, and some choppiness. There is reasonable stress and intonation.	Reads with good phrasing; adhering to punctuation, stress and intonation.
Smoothness	Frequently hesitates while reading, sounds out words, and repeats words or phrases. The reader makes multiple attempts to read the same passage.	Reads with extended pauses or hesitations. The reader has many "rough spots."	Reads with occasional breaks in rhythm. The reader has difficulty with specific words and/or sentence structures.	Reads smoothly with some breaks, but self-corrects with difficult words and/ or sentence structures.
Pace	Reads slowly and laboriously.	Reads moderately slowly.	Reads fast and slow throughout reading.	Reads at a conversational pace throughout the reading.

Scores of 10 or more indicate that the student is making good progress in fluency. Score _____

Scores below 10 indicate that the student needs additional instruction in fluency.

Rubric modified from Tim Rasinski – Creating Fluent Readers